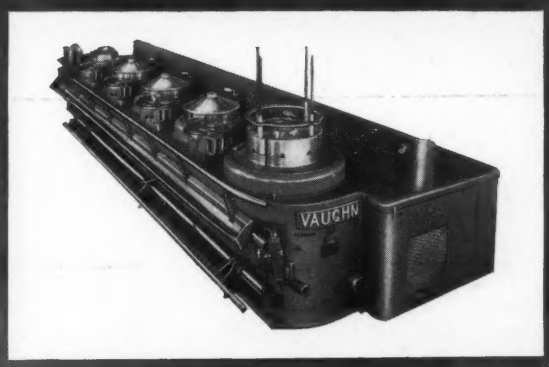
WIRE AND WIRE PRODUCTS

MAY 1944

Vaughn Flexibility

Provides the Maximum flexibility for
War or Peace Time Drawing Operations



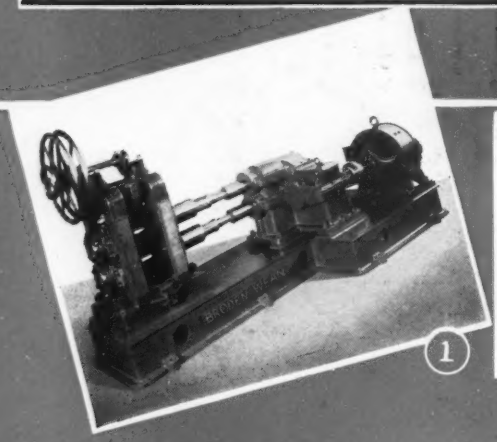
VAUGHN MOTOBLOX

The Vaughn Machinery Co.

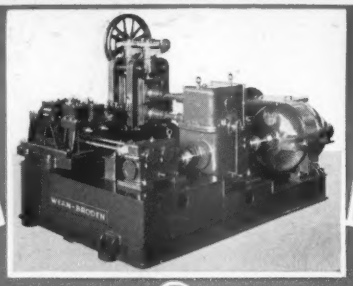
Cuyahoga Falls, Ohio

Complete Cold Drawing Equipment . . . Continuous or Single Hole . . . For the Largest Bars and Tubes . . . For the Smallest Wire . . .

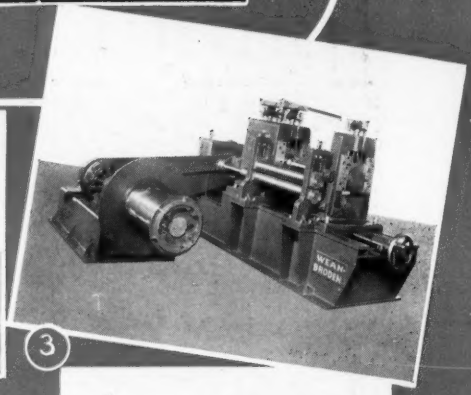
WEAN-BRODEN



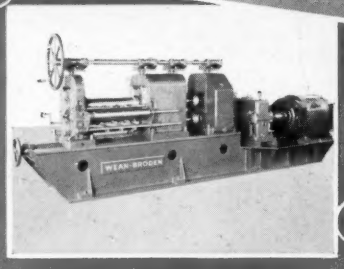
1



2



3



4

1. Small Cold Rolling Strip Mill
2. Special Strip Cold Rolling Mill
3. Strip Reel and Slitting Unit
4. Heavy Duty Slitter
5. Special Alloy Single Draft Heavy Duty Vertical Wire Drawing Block for 5/8" Round Rod

THE Wean Engineering Company, Inc., have long been recognized as Specialists in sheet, strip and tin mill equipment. . . . The Broden Construction Company specializes in the manufacture of narrow strip and wire mill equipment.

With the extended facilities of The Broden Construction Company as a subsidiary of The Wean Engineering Company, Inc., it is now possible to serve the steel industry more effectively.

COLD ROLLING MACHINERY

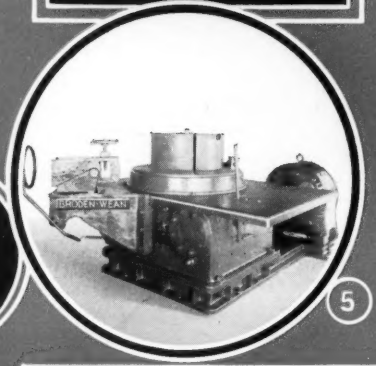
For 36" Wide Material and Narrower

Mills • Reels • Slitters • Levelers • Coilers • Edgers
Scale Breakers • Shears • Scrap Ballers
Continuous Pickling

WIRE MILL EQUIPMENT

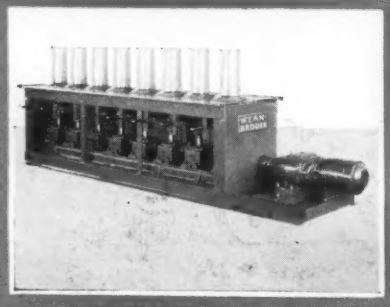
Wire Drawing Machines • Patenting • Galvanizing and Tinning Take-Up Frames • Wire Flattening • Spoolers
Nail Galvanizing and Blueing

HOLMQUIST BARBED WIRE and WIRE FENCE MACHINERY

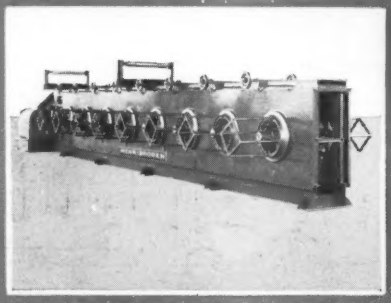


5

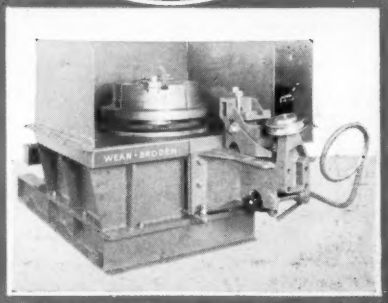
The BRODEN CONSTRUCTION Co., Inc., Cleveland, O.
A SUBSIDIARY COMPANY OF
The WEAN ENGINEERING Co., Inc., Warren, O.



FINE WIRE TINNING UNIT



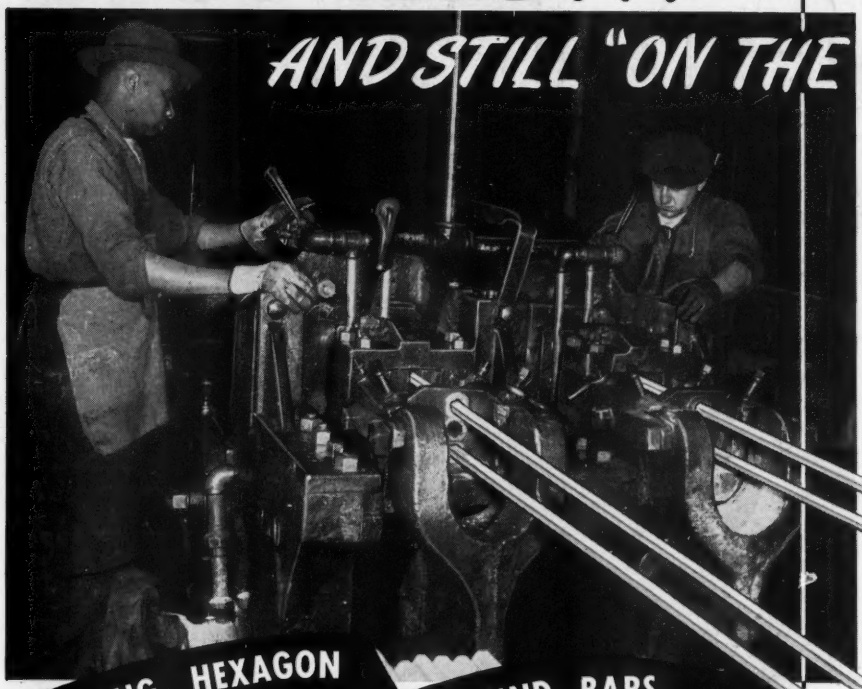
MULTIPLE WIRE TAKEUP FRAME



TWO DRAFT CONTINUOUS WIRE DRAWING MACHINE

• 2000 tons . . .

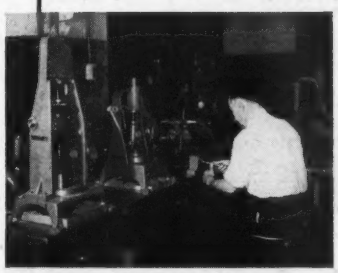
AND STILL "ON THE NOSE"



DRAWING HEXAGON AND ROUND BARS . . . at Champion

Here's what top performance with Standard Carboloy Dies means at Champion Spark Plug Company: (1) *Extra long die life!* . . . Drawing hexagon and round bars up to size $1\frac{1}{8}$", Standard Carboloy Dies have drawn 2000 tons to date and are still "on size." Less than .0001" wear. (2) *Extra fine finish!* . . . finish so fine that subsequent polishing is unnecessary. (3) *Extra close tolerances!* . . . uniform size from end-to-end of bars saves on chucking adjustments for subsequent automatic machining; greater production at low end of tolerance results in more feet from each bar. (4) *More continuous bench operation!* . . . long intervals between die servicing. (5) *Fewer rejects!* . . . 90% reduction in rejects with Standard Carboloy Dies.

At Champion—as at leading mills throughout the country—the plus values in every Standard Carboloy Die pay extra dividends in quality and economy.



Standard Carboloy—Developed die finishing and servicing equipment at Champion assures rapid servicing whenever required.

CARBOLOY COMPANY, INC.
11171 E. 8 MILE BLVD., DETROIT 32, MICHIGAN

Birmingham • Chicago • Cleveland • Detroit • Los Angeles • Newark • Philadelphia
Pittsburgh • Seattle • Thomaston, Conn.

Authorized Distributors: Hartley Wire Die Co., Thomaston, Conn.; Michigan Wire Die Co., Detroit, Michigan

CARBOLOY CEMENTED CARBIDES

TRADEMARK

TRADEMARK

COMPLETE DIE SERVICE FOR WIRE, BAR, TUBING AND SHEET METAL

Assault wire is made STRONGER

with bethanized sinews

Advance scouts sprawled in mud or snow, sometimes far in advance of the lines of combat, report information about the enemy's strength and disposition over a slender telephone line of assault wire.

Carried on a reel strapped to the scout, assault wire must be extremely lightweight, yet tough enough to resist rough handling, excessive vibration and shock. That is why, in making assault wire, strength-building sinews of steel are intermingled with the copper conductors.

Bethanized wire is often selected for this purpose. Its electrolytic zinc coating enables bethanized wire to stand the severe drawing operations necessary for the production of such fine-gage wire without any sacrifice either of physical properties or the protective coating. By the advanced bethanizing process, a coating of 99.9+ per cent pure zinc is deposited uniformly both along and around the wire. This coating is so ductile that it doesn't peel or flake even when the wire is bent, twisted or drawn through dies.

Bethanized wire is doing many other war jobs—from the making of cotter pins to the armoring of submarine cables. Post-war uses may be foreseen that will far exceed all previous ideas as to the possible applications of zinc-coated wire.

Nearly every kind of war equipment requires some form of steel wire, either as an actual working part or in the process of manufacture. That is why such a large proportion of the output of Bethlehem's wire mills has been assigned to war duty, either on the fighting fronts or on the war-production front at home.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

Bethlehem Steel Export Corporation
New York

Shelldraw

COMPOUNDS HAVE THE ANSWER TO BOTH!

• From the finest wire to the heaviest . . . drawing ferrous or non-ferrous metals . . . there's a Shelldraw Compound designed to meet every wire-drawing requirement.

Veterans of many a tough job that at first appeared unsolvable, Shelldraw Compounds come to you backed by a time-tested record of broad, successful experience; plus these outstanding advantages:

1—High soap-fat content. More useful lubricity and metal protection.

2—Stability in storage and in emulsion.

3—Exceptionally easy to clean. Do not require inflammable solvents to remove. Surfaces can be readily cleaned by warm, light alkaline wash.

4—Non-irritating to skin. Clean in appearance . . . odor slight and pleasant.

Why not find out how Shelldraw Compounds can step up *your* production? An experienced Shell Lubricating Engineer will be glad of the opportunity to review your production set-up and make his unbiased recommendations.

SHELL OIL COMPANY, INC.

One of a series of articles on the preparation of metal surfaces for protective finishes

PICKLING COSTS REDUCED

In a previous article the principles of pickling and why inhibitors are essential were discussed. In this review the saving in steel, acid, and steam which can be effected will be presented.

A brief statement of results of inhibiting the pickle bath should precede more detailed explanation. A small portion of Rodine added to the pickle bath effectively inhibits the acid's action on clean metal without retarding its efficiency in removing scale and rust. If a foam-producing type of Rodine is used, a foam blanket will cover the top of the tank, preventing the escape of the objectionable acid fumes which are injurious to both workers and inside steel construction. This blanket also retains the bath's heat, therefore less fuel is required.

The waste in clean metal needlessly dissolved and in acid wasted in dissolving clean metal is shown by means of the following photographic illustrations.

These photomicrographs are of 0.85 to 0.95% carbon polished saw steel.

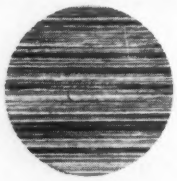


Fig. 4

Figure 4 shows the polished surface before pickling.

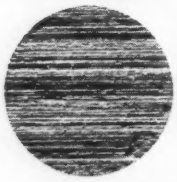


Fig. 5

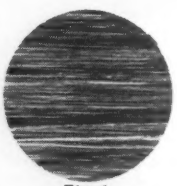


Fig. 6

Figures 5 and 6 show the effect of pickling similar surfaces 5 minutes in a 2 per cent sulphuric acid solution (by volume), heated to 200° F. Figure 5 shows the action of sulphuric acid alone on the surface, while Figure 6 shows the effect of Rodine in preventing the attack on the good metal; in this case, the surface is as free from pits as is the unpickled specimen.

When the samples have been pickled 15 minutes, the effect of the Rodine becomes more pronounced. It will be noted that the uncontrolled acid bath has caused considerable pitting, as shown in Figure 7, but the bath containing Rodine has not changed the surface, as is shown in Figure 8.

Fig. 7

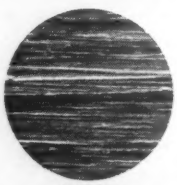
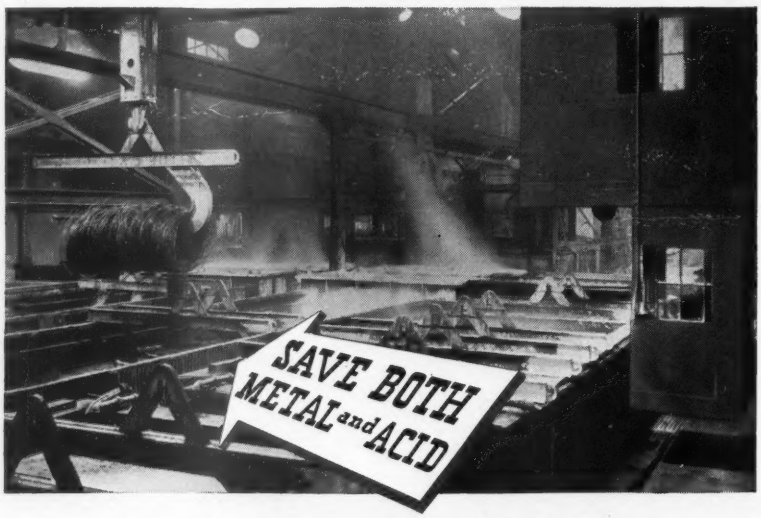


Fig. 8

The waste in metal is plainly shown in these photographs. Any fabricator who pickles wire, sheet, or strip steel can easily demonstrate in his own plant the saving in metal and acid by keeping records for inhibited and for uninhibited acid baths, of metal weights before and after pickling, and amounts of acid required to remove scale and rust.

The economies in steel and acid savings as well as the minimizing of rejection losses from overpickling (causing pitting, embrittlement, blistering, etc.), the avoidance of objectionable acid fumes and steel structural injury therefrom, may all be obtained without slowing production. The cost of Rodine is but a fraction of the actual saving resulting from its use.



Needless waste of critical materials is inexcusable in the present war emergency when scarcities exist in essential supplies and in manpower to produce them.

Rodine

not only prevents overpickling, minimizes acid embrittlement and saves both acid and metal but it makes possible increased production.

The inhibiting principle of Rodine, which confines the action of the acid in the pickle bath to the removal of scale and rust from iron steel and steel alloys, is generally recognized but it is not so well understood that there are many types.

Types of Rodine

Despite the wide range of steel alloys, the use of sulphuric or muriatic acids or combinations of these in varying strengths, there are grades of Rodine adapted to all pickling requirements.

ACP engineers will gladly recommend the type of Rodine for your particular use. They will also cooperate in the solution of any problems concerning cleaning or finishing of metal. Time will be saved if you will furnish as complete details as possible concerning your methods and problems.

Manufacturers of Inhibitors & Metal Working Chemicals

AMERICAN CHEMICAL PAINT CO.
AMBLER ACP PENNA.

Note—West Coast Plants may address inquiries and orders for prompt delivery to Leon Finch, Ltd., 728 East 59th St., Los Angeles, California

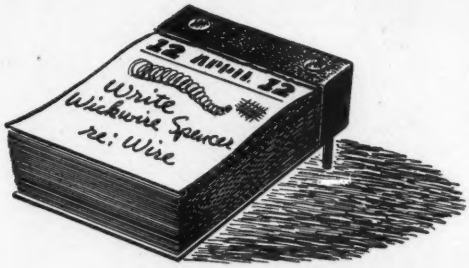
AMERICAN CHEMICAL PAINT COMPANY, AMBLER, PA.

Please send me general Technical Service Data Sheets on

Name_____ Title_____ ☐ *Rodine*

Company_____ ☐ *Pickle Bath Toner*

Address_____ D-5



Memo to Steno re Steel Wire . . . *plus!*

● Many manufacturers who are readying plans now to start peacetime production as soon as possible after the war, are calling us in to contribute. They are having our metallurgists help solve new application problems for steel wire.

Like typical researchers, our scientific staff is more interested in rendering service than in the size of initial orders. And we welcome such inquiries. They are one of the prime reasons for the steady growth of our business in wire and wire products during the past 123 years.

Additional techniques and methods developed to meet the demands of our armed forces in wide variety are enabling us to solve unusual headaches. Our blast furnaces, open hearths and wire mills will soon be ready to meet your needs.

If you want steel wire of any size, temper, analysis or finish . . . round, flat or shaped . . . write us about your needs today.

Send your wire questions to

WICKWIRE SPENCER STEEL COMPANY

500 FIFTH AVENUE, NEW YORK (18), N. Y.

Abilene, Buffalo, Chattanooga, Chicago, Detroit, Houston, Los Angeles, Philadelphia, San Francisco, Tulsa, Worcester

STANDS FOR FRIENDLINESS

THE PITTSBURGH REGIONAL MEETING

of the

WIRE ASSOCIATION

will be held on

May 19, 1944 at the William Penn Hotel

All members of the Wire Association are cordially invited. They may bring guests.

The Speakers Committee feels pardonably proud that they have prevailed upon DR. J. HUBERT VYKEROYD, Ph.D. to make the principal address. Dr. Vykeroyd is now serving in an Advisory capacity with the British Purchasing Commission in Washington. He has led a most interesting life . . . during World War I, he left Cambridge University and served as a foreign war correspondent with the London Daily Mail. His graphic reports of that memorable conflict made journalistic history. In 1922, he accepted the chair of Philosophy at the University of London, which post he occupied until the early part of 1940. His knowledge of international affairs make him the obvious choice of the British Government for his present post. Dr. Vykeroyd was awarded a degree by Columbia University in 1942. He has written a number of illuminating articles for Colliers, World Works and other publications. He is a forceful and dynamic speaker . . . and we are confident his message is eagerly awaited.

The technical subject will be "Drawing Compounds and Wire Finishes," which will be covered by Floyd Hauger, Vice-President of Standard Industrial Compounds, Chicago, Ill. Mr. Hauger, with a background of practical steel mill experience, is well qualified to give a practical talk from a wire producer's standpoint. Following the technical meeting the Navy Department motion picture, "Seabees—The Navy's Fighting Construction Men the World Over," will be shown.

The Time: 6 P. M. sharp, Friday, May 19, 1944.

The Place: William Penn Hotel, Pittsburgh, Pa.

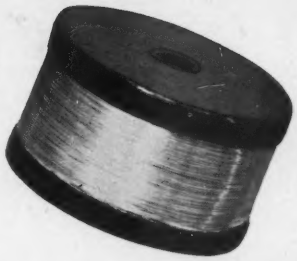
The Cost: Registration fee, $4.00, which includes a good dinner.

Please Note: For the benefit of those unable to arrive in time for the dinner, a special registration fee of only $2.00 for attendance at the technical session following the dinner will be charged.

So that we may make adequate arrangements with the Hotel management for dinner and seating accommodations, please advise promptly by letter or card that you will attend. See you in Pittsburgh!

RICHARD E. BROWN
Executive Secretary

300 Main Street — Stamford, Conn.



Wire

FOR WARTIME PRODUCTION OR PEACETIME PLANS

Perhaps you have never considered Continental a source for a great many different types, sizes and finishes of carbon wire. That's why we show on this page a few samples of the hundreds of different kinds of Continental wire. Possibly, one of these special shapes or finishes may mean savings or advantages to you.

Steel from Continental's own furnaces and rolling mills is made into wire from 34 gauge to ½ inch . . . in many standard and special shapes . . . and a wide range of finishes. Call on Continental for wire to fit wartime production or peacetime plans.

CONTINENTAL STEEL CORPORATION, KOKOMO, INDIANA

CONTINENTAL STEEL CORPORATION
SUPERIOR
WIRE

CONTINENTAL
STEEL CORPORATION

PRODUCERS OF— SHEETS: Black, Galvanized, Copperior, Hot and Cold Rolled, Special Coated, Long Terne, etc.
WIRE: Bright Basic, Annealed, KONIK, Coppered, Tinned, Special Manufacturer's, etc.

COPYRIGHT 1944—JONES & LAUGHLIN STEEL CORPORATION

FROM AN ORIGINAL DRAWING BY ORISON MACPHERSON

MOUNTAINS SMELTED TO GET IRON FOR STEEL

Mountains of iron ore, coke and limestone are charged every year into America's blast furnaces. The ore is smelted into iron by volcanic fires fanned by tornadic blasts of millions of tons of super-heated air. The molten iron streams out of the towering stacks day and night, week in and week out, to be converted into steel—in 1943, for war, the greatest tonnage of steel ever produced in this country. Blast furnace men, steel men and metallurgists, through long experience and continuous research, are building into iron that better quality essential to production of the new steels now hastening victory—the versatile steels that will serve peace-time needs as soon as the war is won.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH, PENNSYLVANIA

J&L STEEL

CONTROLLED QUALITY STEEL FOR WAR

J&L STEEL

GREATER PRODUCTION *Without* PLANT EXPANSION

Save floor space by using the ceiling for handling wire and rod. Increase storage capacity the efficient Cleveland Tramrail way.

Cleaning house cranes eliminate congestion and cut handling time.

In these days when greater and greater production is called for in mills and plants drawing and fabricating wire and rod, Cleveland Tramrail offers a real solution.

Without plant expansion or new building construction your production can be greatly stepped up by modern Cleveland Tramrail methods. Equipment is available for every department.

Cleaning house cranes, block-stripping cranes, hairpin hook carriers and other Cleveland Tramrail equipment streamline the operations, accelerate the production flow, eliminate waste effort and cut costs.

Don't remain hampered! Investigate Cleveland Tramrail. Learn what is being done by others, large and small. Many installations to study.

Cleveland Tramrail is the leading supplier of block-stripping cra and carriers for both internal and external stripping.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
1141 East 283rd St. Wickliffe, Ohio

CLEVELAND TRAMRAIL

MAKE YOUR PLANS NOW TO ATTEND
the LOS ANGELES REGIONAL MEETING of the
WIRE ASSOCIATION
on JUNE 9, 1944

The meeting will be held in the evening, starting with dinner and followed by an interesting technical session.

Speakers will include a man of nationally known reputation, who will discuss the general business outlook in the period ahead, and A. R. Zapp, Manager of the Firthaloy Division of the Firth-Sterling Steel Company of McKeesport, Pa., whose paper will depict the developments we are likely to see in the carbide wire drawing die.

Following the technical session there will be shown the latest of the Navy's motion pictures: "The Seabees—the Navy's Fighting Construction Men the World Over". This film is new and said to be the finest of its kind yet produced.

The Time: 6:30 P. M. Friday, June 9, 1944

The Place: Hotel Biltmore, Los Angeles, Calif.

The Cost: Registration Fee $4.00, including Dinner.

We hope you'll come — you may bring guests

— Strictly Informal —

SEND RESERVATIONS TO THE

WIRE ASSOCIATION

300 MAIN STREET • STAMFORD, CONN.

COMMITTEE ON ARRANGEMENTS

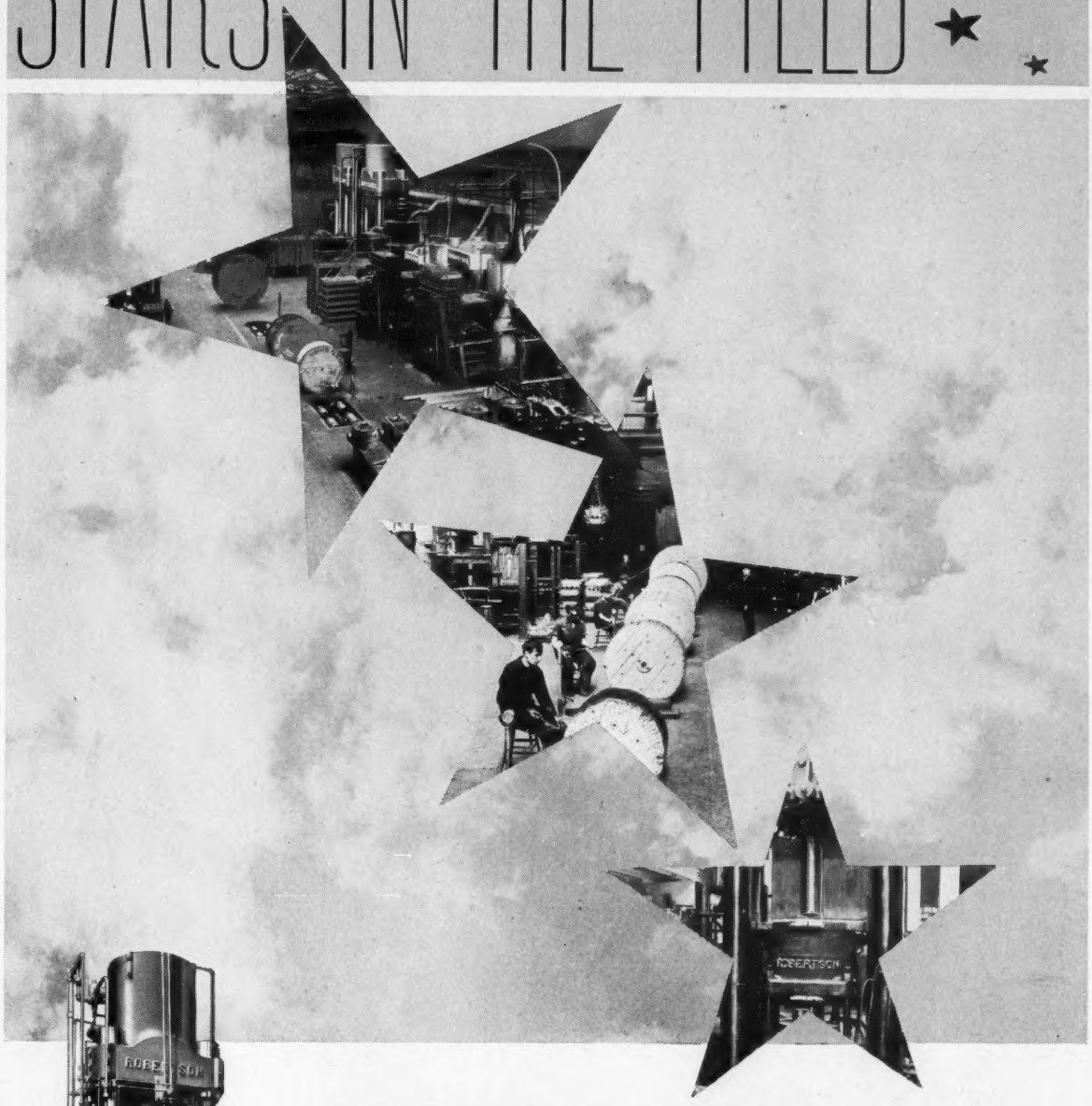
A. R. ZAPP, Manager, Firthaloy Division, Firth-Sterling Steel Company, Chairman

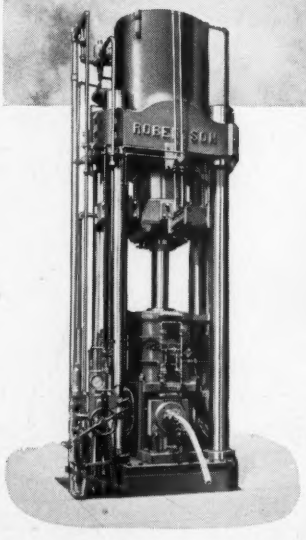
KENNETH H. DAVIS, President
K. H. Davis Wire & Cable Corp.
Los Angeles 11, Cal.

RICHARD E. BROWN
Executive Secretary
Wire Association

EMERSON SPEAR, Vice President
Pacific Wire Rope Co.
Los Angeles 21, Cal.

STARS IN THE FIELD





ROBERTSON

THE BIGGEST NAME IN LEAD CABLE ENCASING EQUIPMENT

Extrusion Presses, Hydraulic Pumps, Melting Furnaces and Pots, Dies and Cores, Hydro-pneumatic Accumulators, and Lead Sheath Stripping Machines.

Robertson Equipment is used by Roebling, Phelps Dodge, General Cable, General Electric, Crescent, Simplex, Northern Electric, Collyer, Western Electric, Phillips, Anaconda, Okonite, Kennecott, Kerite, American, Paranite, Goodyear, U. S. Rubber, Goodrich, Swan, Boston, and dozens of others.

JOHN ROBERTSON CO., INC., 131 WATER STREET, BROOKLYN, NEW YORK—Established 1883

BETTER WIRE DRAWING WITH TAILOR-MADE LUBRICANTS

You cannot expect to get the high speed results and maintained quality of finish demanded of you today with ordinary drawing lubricants. Adequate "carry-through", minimum die wear and the proper finish call for lubricants specifically designed for the particular wet or dry drawing operation you carry on, as well as for the definite type of wire you are drawing.

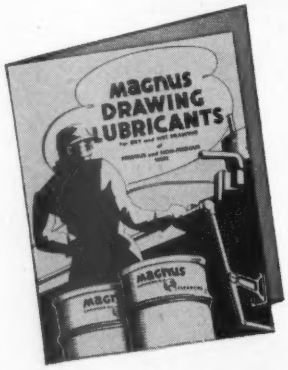
MAGNUS
WIRE DRAWING COMPOUNDS

are virtually all "tailor-made". That is, they have been designed to do a definite job on a certain type of wire by a specified method. There are compounds for insuring exceptionally good rolling action in the die box; for providing adequate carry through on continuous machines and at the same time providing a film which is not so heavy as to prevent the wire coming from the final pass clean and bright. Some compounds are especially designed for medium and low carbon steel wire; others are particularly successful on high speed low carbin wire, or brass, bronze, stainless or monel. The line includes special compounds for wet, dry and grease drawing.

Usually one of these items will be found to fit exactly the needs of a mill for a definite drawing problem, but where a special lubricant is needed to meet any particular combination of conditions, Magnus is ready to work out a special compound to meet them.

They Keep This One in Stock for Their Really Tough Jobs - - - - -

Magnus 52C-1 was developed to provide better lubrication in multi-pass drawing of high carbon steel wire at high speeds. It has made possible considerable increases in production, since it carries through to the last pass at a speed of 40% greater on operations where ordinary lubricants provided next to no lubrication on the last passes, and had to be used at lower speed to get even such results. Today, many a mill makes it a point to have a stock of 52C-1 on hand at all times, for use on their troublesome drawing jobs, not only on high carbon, but on stainless and other alloy wires.



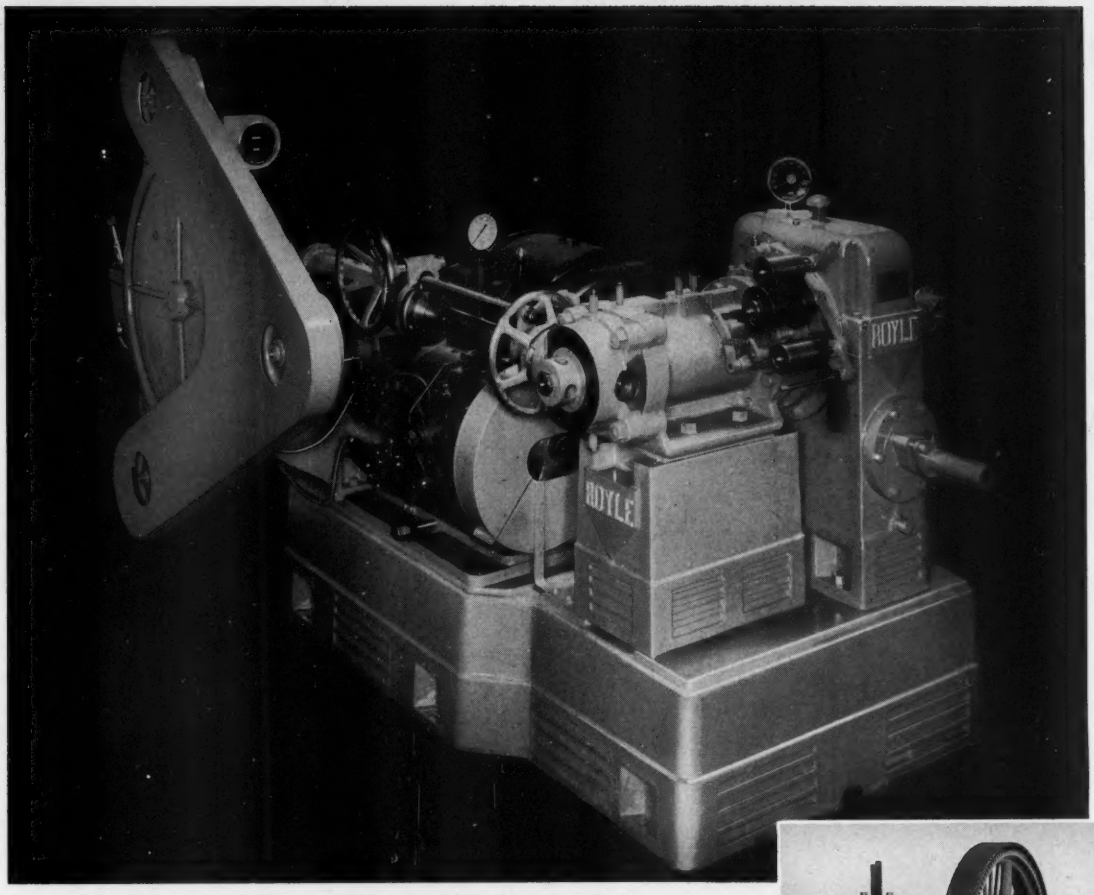
Write for Your Copy of This Bulletin

It covers the complete line of Magnus Drawing Lubricants and should be of considerable assistance to you in selecting a compound to do a better job for you.

MAGNUS CHEMICAL COMPANY
188 SOUTH AVENUE **GARWOOD, N. J.**

Representatives in Principal Cities

Magnus WIRE DRAWING COMPOUNDS



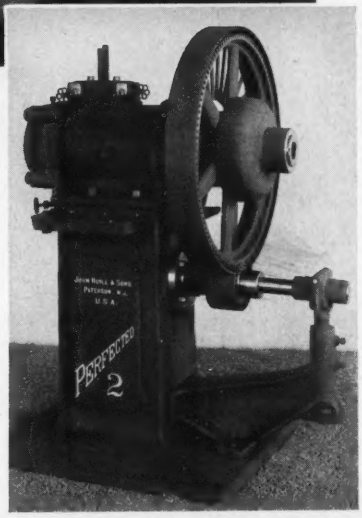
No. 2 Royle Continuous Vulcanizing Machine equipped with Stock Screw Speed Tachometer and Sperry Exactor Control.

Extruding in 1944 with a 1905 Royle Tubing Machine

Yes, it is being done. Not in one isolated plant but in many where ingenuity has been substituted for modern machines. These processors have done a grand job in literally interpreting "make it do".

Essentially the continuous extrusion process hasn't changed a great deal since John Royle & Sons first introduced it sixty-four years ago. There have been refinements—the most apparent being in the field of temperature control and in the development of accessory equipment.

When the war has been won these "turn of the century" tubers will be retired for modern machines. The post-war Royle Extruder probably won't be a startling revelation. Into it will go all of the "know how" gained from pioneering in the continuous extrusion machinery field since 1880.



No. 2 Royle Tubing Machine of 1905

JOHN ROYLE & SONS

ROYLE PATERSON N. J.

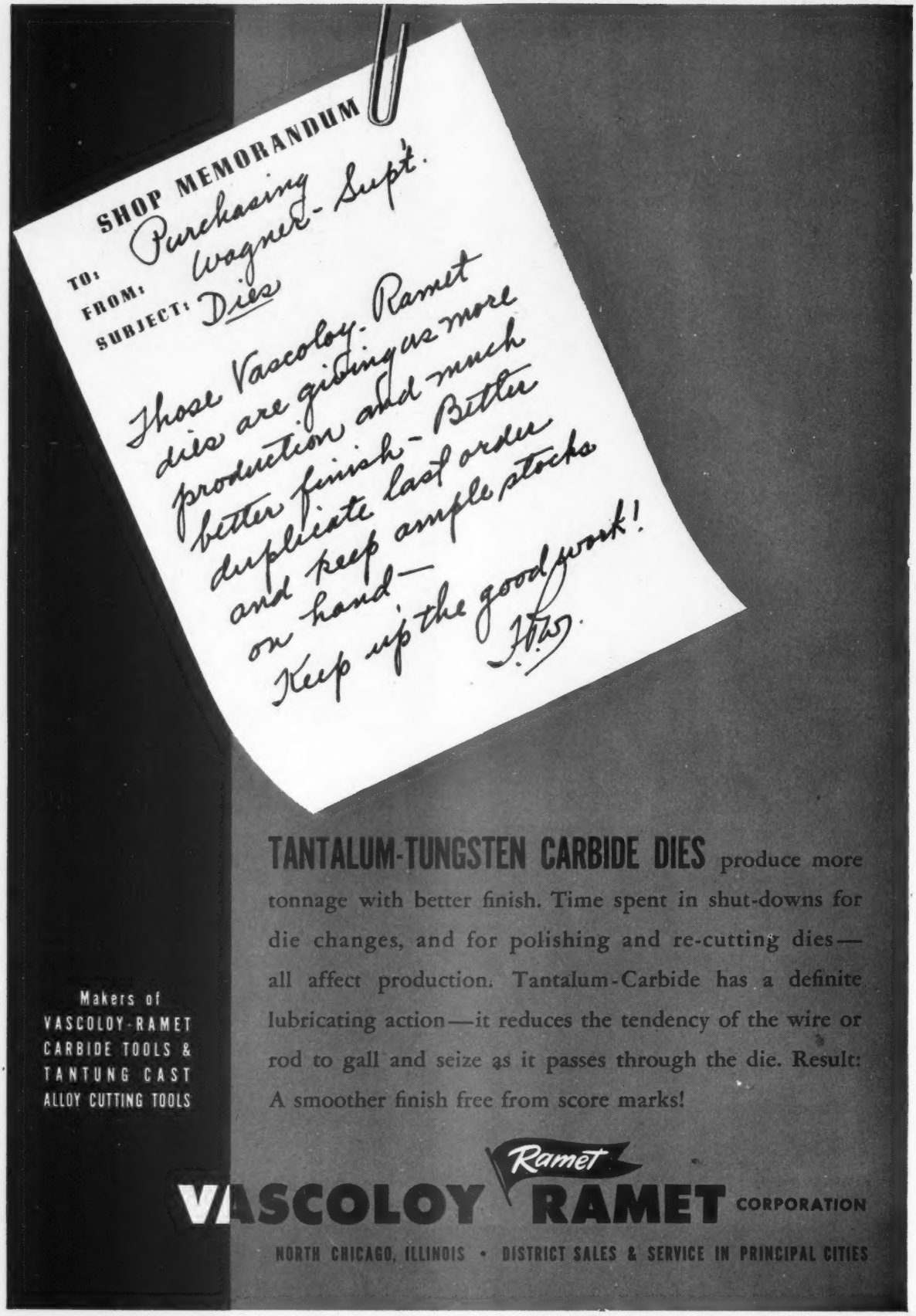
PIONEER BUILDERS OF EXTRUSION MACHINES SINCE 1880

Continental Europe
James Day (Machinery) Ltd.
London, England

Home Office
B. H. Davis J. W. VanRiper
SHerwood 2-8262

Akron, Ohio
J. C. Clinefelter
UNiversity 3726

PATERSON 3, NEW JERSEY


SHOP MEMORANDUM
TO: Purchasing
FROM: Wagner - Supt.
SUBJECT: Dies
Those Vascoloy-Ramet dies are giving us more production and much better finish - Better duplicate last order and keep ample stocks on hand—
Keep up the good work!
H.W.
TANTALUM-TUNGSTEN CARBIDE DIES produce more tonnage with better finish. Time spent in shut-downs for die changes, and for polishing and re-cutting dies—all affect production. Tantalum-Carbide has a definite lubricating action—it reduces the tendency of the wire or rod to gall and seize as it passes through the die. Result: A smoother finish free from score marks!
Makers of
VASCOLOY-RAMET
CARBIDE TOOLS &
TANTUNG CAST
ALLOY CUTTING TOOLS
Ramet
VASCOLOY RAMET CORPORATION
NORTH CHICAGO, ILLINOIS • DISTRICT SALES & SERVICE IN PRINCIPAL CITIES

REPLACE

THE OLD and antiquated

WITH

THE NEW AND IMPROVED

WE announce the compounding of a new material, STANCOAT C, in which copper or liquor coated rods or wire are dipped after plating. This Compound eliminates the water storage or liquor draw-out tubs. The wire is drawn from a dry reel and brighter liquor or copper finish is obtained than in the old wet method.

DRAWING OF LIQUOR OR COPPER COAT FROM DRY REEL √'S AS FOLLOWS:

- √ Eliminates wet storage.
- √ Plating is done in Cleaning House in one tank instead of in individual barrels or tubs.
- √ Insures uniform color and thickness of coating.
- √ Coating is air dried.
- √ Makes storage and transport on dry trucks possible.
- √ Attains complete neutralization of acid from plating bath.

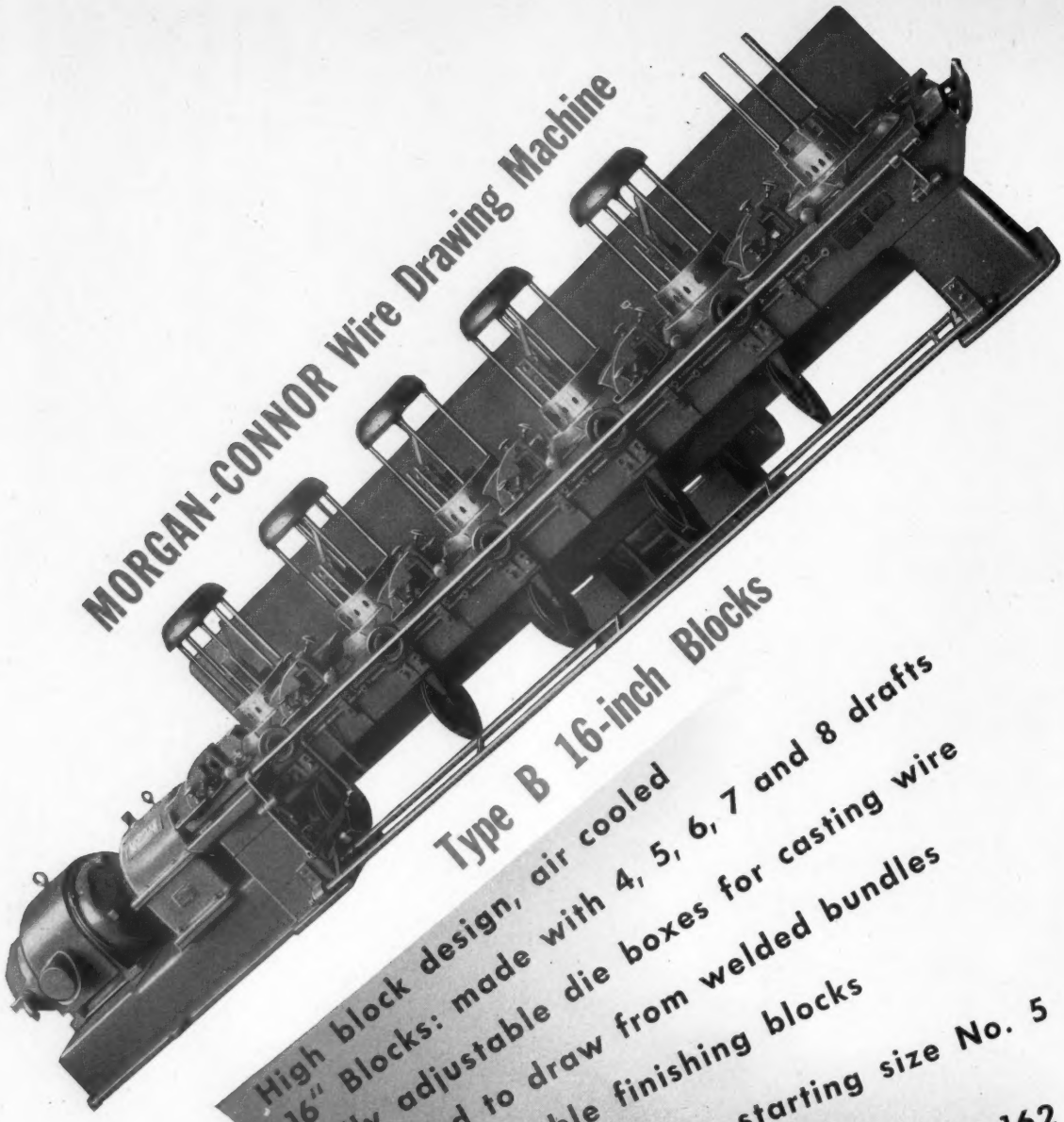
Standardize with Standard

STANDARD INDUSTRIAL COMPOUNDS CO.

4600 W. FERDINAND STREET

CHICAGO 50, ILLINOIS

Standardize with Standard



MORGAN-CONNOR Wire Drawing Machine

Type B 16-inch Blocks

High block design, air cooled
16" Blocks: made with 4, 5, 6, 7 and 8 drafts
Fully adjustable die boxes for casting wire
Designed to draw from welded bundles
Interchangeable finishing blocks
Low carbon maximum starting size No. 5
High carbon maximum starting size .162
patented 180,000 #/in.²

MORGAN CONSTRUCTION COMPANY • Worcester, Mass.

W-97

PLAN NOW WITH MORGAN

WIRE DRAWING MACHINES

WIRE AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 19. MAY, 1944 No. 5

Designated as

Official Publication By The Wire Association

Contents

Device for Calculating Wire Mill Problems ..... By E. H. Webb 291

Cold Rolling of Narrow Strip and Its Equipment Requirements ..... By R. J. Wean 295

Glass Processing Wire and Steel Products ..... By John J. Caugherty 299

Wire Association Elects Officers Medal Award — Plans for 1944 306

Worcester Meeting of the Wire Association — Address by D. D. Buchanan 321

Government Wire Production Information 308

A Review of Recent Wire Patents 314

Outstanding Personalities of the Wire Industry 316

Index to Advertisers 332

Where to Buy 333-336

— ASSOCIATE EDITORS —

Kenneth B. Lewis, Consulting Wire Mill Engineer
Lt. Com. W. H. Spowers, Jr., Consultant on Galvanizing
Lancaster, Allwine & Rommel, Consultants on Patent Information

Richard E. Brown, General Manager
R. S. Spengel, Business Manager
E. D. Sickels, Advertising Manager

Publication Office: Washington, N. J.
Executive Office: Stamford Trust Co. Bldg., 300 Main St., Stamford, Conn.

Annual Subscription, U. S. $5.00, Canada $5.00

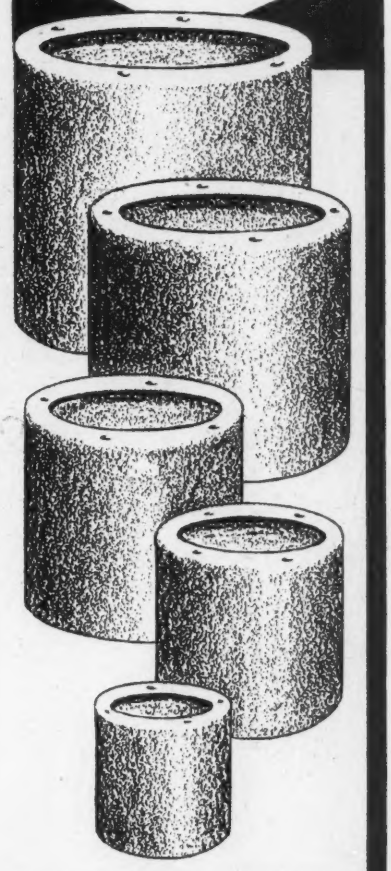
50 Cents a Copy in U. S. Issued Monthly Foreign, $7.50

October Convention Issue $1.00 a Copy
January Convention Discussions Issue $1.00 a Copy

Copyright 1944, Quinn-Brown Publishing Corp. WIRE AND WIRE PRODUCTS is fully protected by copyright and nothing that appears in it may be reprinted wholly or in part without permission.

WIRE & WIRE PRODUCTS, Vol. 19, No. 5, May, 1944, Executive Office 300 Main St., Stamford, Conn. Published by the Quinn-Brown Publishing Corp., Richard E. Brown, President; R. S. Spengel, Secretary and Treasurer. Publication office, 13 West Church Street, Washington, N. J. Subscription price: U. S., $5.00; Canada, $5.00 per year, 50 cents per copy; Foreign, $7.50 per year. Entered as second class mail at the Post Office, Washington, N. J., under Act of March, 1879.

STEVENS TRAVERSE



From actual experience records, we can give you seven reasons why the Stevens Traverse for Reels will fill the bill for you. Write for them today.

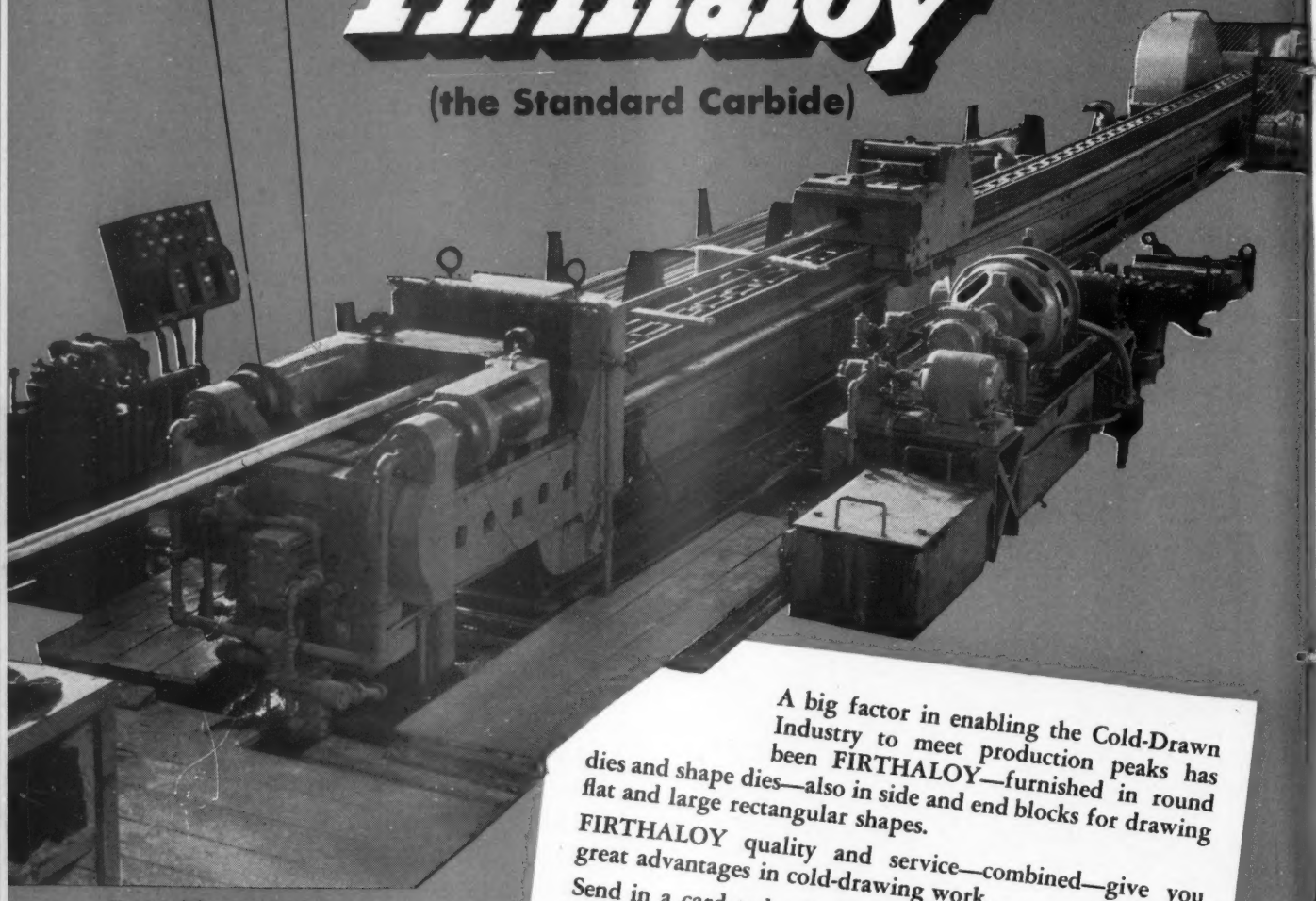
Manufactured under license arrangements with Western Electric Company, Incorporated.

THE STEVENS METAL PRODUCTS CO., NILES, OHIO

PEAK PRODUCTION

COLD-DRAWN INDUSTRY meets war quotas with Firthaloy

(the Standard Carbide)



Photograph by courtesy of
The McKay Machine Company

A big factor in enabling the Cold-Drawn Industry to meet production peaks has been FIRTHALOY—furnished in round dies and shape dies—also in side and end blocks for drawing flat and large rectangular shapes.

FIRTHALOY quality and service—combined—give you great advantages in cold-drawing work.

Send in a card today, reserving one or more copies of our new Shape-Die Price List, No. FY-1004 . . . soon off the press. Latest reduced prices are listed.

ARMY E NAVY

Firth-Sterling
STEEL COMPANY

FIRTH-STERLING FIRTHALOY QUALITY

Offices: McKEESPORT, PA. - NEW YORK - HARTFORD - PHILADELPHIA - CLEVELAND - DAYTON - DETROIT - CHICAGO - LOS ANGELES

WIRE AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip.
Wire Products and Insulated Wire and Cable.
DRAWING --- ROLLING --- EXTRUDING --- FORMING --- FABRICATING

Vol. 19 MAY, 1944 No. 5

Device For Calculating Wire Mill Problems

By E. H. Webb,
President, The Webb Wire Works,
New Brunswick, N. J.

RECENT articles in "Wire & Wire Products," regarding calculations used in wire mill prompts me to suggest a calculator that I have found useful. It is with much reluctance that I must confess that the calculator is used in connection with a new wire gauge. This gauge is based on the equal reduction in sectional area between each wire gauge number also the reduction in 10 gauge numbers, as #9 to #19, or #6 to #16, is a reduction of area in section of 90%. As a start I have used,

9 = .1128" diam. area .0100
#19 = .0357" diam. area .001
#29 = .01128" diam. area .0001
#39 = .00357" diam. area .00001

STARTING from #1 gauge the full sizes are as shown in Table A.

TABLE A

# 1 = .2834"	#11 = .0896"	#21 = .0283 "	#31 = .00896"
# 2 = .2526"	#12 = .0798"	#22 = .0252 "	#32 = .00798"
# 3 = .2251"	#13 = .0711"	#23 = .0225 "	#33 = .00711"
# 4 = .2006"	#14 = .0634"	#24 = .0200 "	#34 = .00634"
# 5 = .1788"	#15 = .0565"	#25 = .01788"	#35 = .00565"
# 6 = .1594"	#16 = .0504"	#26 = .0159 "	#36 = .00504"
# 7 = .1420"	#17 = .0449"	#27 = .0142 "	#37 = .00449"
# 8 = .1266"	#18 = .0400"	#28 = .0126 "	#38 = .00400"
# 9 = .1128"	#19 = .0356"	#29 = .01128"	#39 = .00356"
#10 = .1006"	#20 = .0318"	#30 = .0100 "	#40 = .00318" etc.

TABLE B

½ — 10.9%	3 — 49.9%	5 — 71.2%	10 — 90.0%	
1 — 20.6%	3½ — 55.3%	6 — 74.9%	11 — 92.0%	
1½ — 29.2%	4 — 60.2%	7 — 77.6%	12 — 93.7%	
2 — 36.9%	4½ — 64.5%	8 — 84.1%	13 — 95.0%	
2½ — 43.8%	5 — 68.4%	9 — 87.4%	14 — 96.0%	15 — 96.8%

✦ ✦ ✦

THE reduction of sectional area between sizes is shown in Table B.

✦ ✦ ✦

I MADE up a calculator as follows: By drawing a circle 5" diam, another concentric circle 4¼"; — on radii 36 degrees apart, I place consecutively all full sizes from .1128" to .318"; on radii 3.6 degree, I place the appropriate 1/10 sizes (Scale A). In-

Designated as Official Publication by the Wire Association

side of 4¼" circle I draw another circle 3½" diam. and place consecutively the corresponding wire sizes .0357" to .1006" with the appropriate 1/10 sizes in between the full sizes (Scale B). I then have 200 wire sizes .3527" to .0357" in two concentric scales on a plaque. I make a disk (C) 3½" diam. and draw a circle 2¾" diam. writing on radii within this disk the four digits representing the area of corresponding wire diams. on scale A and B. Then on the plaque .1128" (Scale A) and .0357" (Scale B) will line up with 1000 on disk C; .2006-.0634 with 3162 and; .2526-.0799 with 5012. Also inside of the 3½" diam, circle on the disk there are written the feet per lb. corresponding to the diam. of the wire when disk is in primary position, that is 1000 lines up with 1128-.0357. In such a position the reading would be .1128-.0357-1000 29.4 feet; .2006-.0634-.3162-9.31 ft. With the disk in the primary position it gives the significant digits for the breaking strength for all sizes of wire at 100,000 lbs. p.s.i. as follows:

.1128 — 1000 lbs.	.0357 — 100 lbs.
.2006 — 3162 lbs.	.0634 — 316.2 lbs.
.2526 — 5012 lbs.	.0799 — 501 lbs.

etc.

✦ ✦ ✦

BY placing number 2754 on disk (C) in line with .1128-.0357, we obtain the breaking stress at 275,400 lbs. p.s.i. of all wires as follows:

275,400 p.s.i.

.1128 — 2750 lbs.	.0357 — 275 lbs.
.2006 — 8710 lbs.	.0634 — 871 lbs.
.2526 — 13800 lbs.	.0799 — 1380 lbs.

✦ ✦ ✦

CONVERSELY by placing the number on the disk representing the actual breaking strength of the wire against the diameter of the wire on the plaque, one reads against line .1128-.0357 the figure which will represent the tensile per square inch for that wire. A test of 3467 lbs. for wire .1251 diam. gives tensile strength per square inch 281,800 lbs.

I AM illustrating how easily some of the problems can be solved with the aid of this calculator.

✦ ✦ ✦

PROBLEM #1 (Page 587, E. J. Crum, Wire & Wire Products, October, 1943).

Reduction in area in drawing .062 from 148.

Solution

Count the gauge numbers from 148 to .062 namely 7½ sizes or 82%.

✦ ✦ ✦

PROBLEM #2 (Page 587, E. J. Crum, Wire & Wire Products, October, 1943).

What sizes to use in drawing .072 to give same reduction in area as .080 from 192.

192—.080—7½ sizes 82%
170—.072—7½ sizes 82%

✦ ✦ ✦

PROBLEM #1 (Page 597, E. J. Crum, Wire & Wire Products, October, 1943).

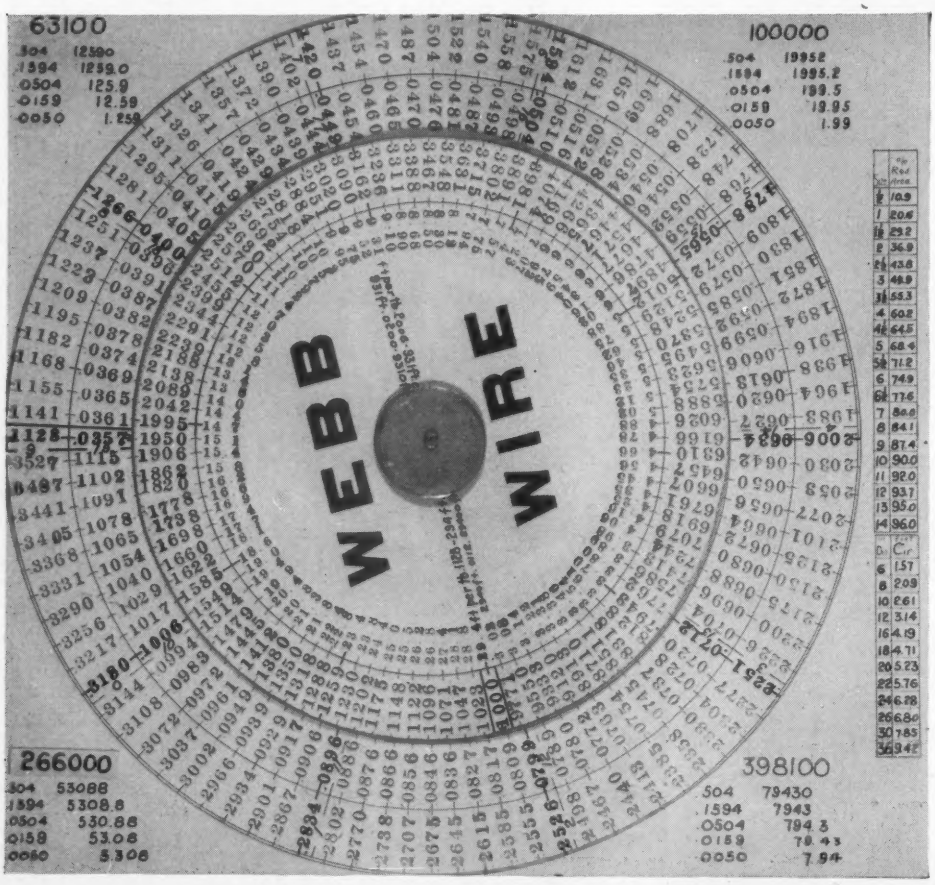
Size of bottom die on double deck block finishing .080 diam. blocks 24" and 17" respectively allowing 10% slippage.

✦ ✦ ✦

PROBLEM #1 page 597 in Mr. E. J. Crum's paper is one of footage with the relation of 24 to 17 plus an allowance of about 10% for slippage 24 ft. on the disk is between 24.4 and 23.8; 17—10% = 15.3 between 15.4 and 15.1 or 20 divisions on the disk which equals two sizes in the plaque. To draw .080 (.0799) use .1006 or 36.9% of reduction area (2 sizes) and to obtain equal reduction in drawing use .1266" diameter (2 sizes) entering of wire.

✦ ✦ ✦

PROBLEM #1, (Page 598, E. J. Crum, Wire & Wire Products, October, 1943).



Die sizes in drawing 162 to .062 in six drafts.

162 to 062 8.3 sizes
6 drafts 1.4 per size
139 - 118 - 100 - 085 - 075 - 062

✦ ✦ ✦

PROBLEM #2

Drawing 162 to .080 with no draft over 25% reduction in area 162 & .080 = 75% (74.9) or 6 sizes. 5 drafts would be: 1.20 sizes per draft or 24%.

Drafting
1 size - 1¼ - 1¼ - 1¼ - 1¼
20% 24^s 24^s 24^s 24^s
143

Chart #6 page 598 all drafting determined by gauge numbers.

✦ ✦ ✦

I ALSO make up a chart based on this gauge starting with sizes 318 on the top of the ordinate down to .0318 at the bottom (20 sizes) and start with 1259 at the left of the abscissa ending with 20 division numerals 1259. I find that under the proper conditions of wire drawing, that is patenting, cleaning, coating, reduction in drafting together with speed, etc., the plot of actual breaking strength of wire against diameter is a straight line. For every reduction in wire size (ordinate) the actual breaking strength is reduced ¾ full units in the breaking strength (abscissa). For example, 8 sizes reduction in diameter equals 84% reduction in area and 6 divisions reduction in breaking strength. .112 Wire Patented 166,000 p.s.i. = 1660 lbs. finishes 8 sizes .0449, 6 units reduction 416 lbs. (actual breaking strength) or 263,000 lbs. p.s.i. an increase of 97,000 lbs. p.s.i. According to **Mr. Ackins'** formula, the increase would be as follows:

70 @ 930	65,100
10 @ 2000	20,000
4 @ 3000	12,000
	97,100

✦ ✦ ✦

IN this connection it is interesting to consider the effect of wire drawing carbon steel in contrast to the effect of wire drawing of 18-8 Stainless Steel. In drawing six sizes of 18-8 the reduction in strength may be less than one unit in the breaking strength contrasting to a reduction 4½ units in drawing carbon steel. It would seem, therefore, that in cold working 18-8 Stainless Wire a new constituent has been formed as well as a change in structure. The effect of the new constituent in 18-8 Stainless is most noticeable in the early drawing stages.

THE gauge is close to the B&S gauge but whereas in our gauge the diameters repeat themselves in #6 = .1594, #16 = .0504, and #26 = .01594 and #36 = .0050 in the B&S gauge #6 = .162, #16 = .0508 and #26 = .01594, and #36 = .0050. A gauge using preferred numbers does not quite accomplish as much as our gauge, since #9 = .112 area .009852″ and #19 = .0355″ area .0009898″. It seems to me an advantage to use an area of .01000 as the starting point from which to develop an uniform gauge.

✦ ✦ ✦

THE calculator illustrated is not perfect as there is some distortion in making the photograph.

✦ ✦ ✦

IT may be noticed that there is seemingly total disregard of the decimal point, but on the contrary it is very important like "Deuces Wild" and it should not be discarded but placed in its proper position like one familiar with the game. A wire man would know at once that a wire .028 diam. testing 190 lbs. is not 30,900 lbs. p.s.i., but 309,000 lbs. per square inch.

THE PITTSBURGH REGIONAL MEETING
OF THE
WIRE ASSOCIATION

Will convene at 6 p. m., Friday, May 19, 1944, at the
WILLIAM PENN HOTEL, PITTSBURGH, PA.

Present plans include an entertaining speaker, who will address us briefly. Technical papers on the cleaning of rods and the use of the new coating compounds, a talk on our man-power outlook for the balance of the year, and a war motion picture will be the features.

The registration fee, which will include a good dinner, will be $4.00. As a special courtesy to those who cannot arrive in time for dinner, a fee of $2.00 will be charged to the technical session only, which starts at 8 p. m.

We want you to be there and hope you can arrange to be with us for dinner. Members may bring guests. This will be an important session; don't miss it!

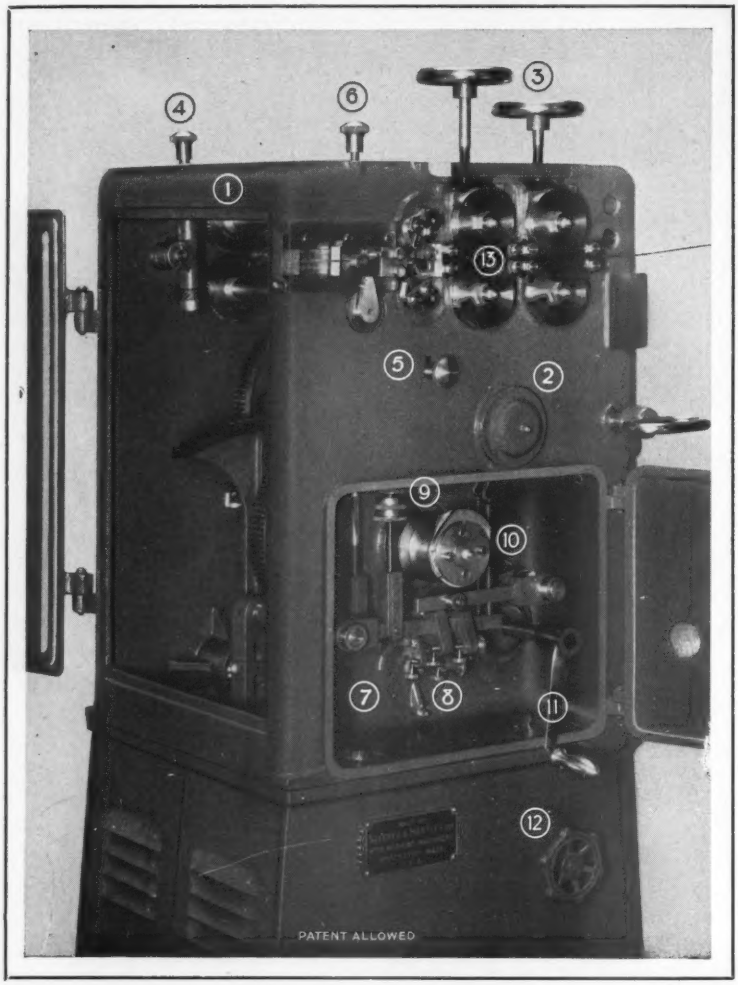
To enable us to make adequate dinner reservations, you are asked to advise us promptly as to your attendance and the number of guests you will have—specify the dinner or the technical session. Please send reservations to

RICHARD E. BROWN
Executive Secretary
300 MAIN STREET STAMFORD, CONN.

13 Points of Superiority

in

No. 1 Universal Spring Coiler



1- One piece cast iron housing for rigidity and perfect alignment.

2- Ball Bearing construction throughout on all rotating shafts.

3- **Convenient Controls—** Individual pressure control for each pair feed rolls.

4- Individual simple adjustment for cutter alignment, easily adjusted from upper to lower cutter.

5- Pitch and

6- Diameter control readily accessible.

7- Pitch and Diameter Cam control located in recess in front housing.

8- Rapid and micrometer adjustment of compound blocks facilitates set-up time.

9- Pitch stop conveniently located and quickly adjusted.

10- Combination cam hub for pitch and diameter cams, completely removable from machine.

Both pitch and diameter cams may be shaped and timed on the cam hub for special springs and the entire unit removed from the machine, thus reducing set-up time. Additional cams and hubs can be applied for this purpose.

One piece solid cams can be used on this removable cam hub.

11- Removable ratchet-type crank for set-up purposes only. Removed during operation.

12- Motor or Pulley Drive as required with variable Speed Transmission for production range if desired.

13- Tooling interchangeable with previous Sleeper & Hartley models.

INCREASED CAPACITY

Compound gearing for 96" feed if desired.

Other Improved Features—

Morse Free Wheeling Clutch for high-speed accuracy. Morse Free Wheeling Recoil Clutch, as extra equipment, if desired.

Single cutter operation.

Wear free diameter slide connection.

No. 1 Universal Spring Coiler

Segment Type

48" Model *Series 666*

Wire Range .018" to .080"

SLEEPER & HARTLEY, Incorporated

DESIGNERS AND BUILDERS

Worcester, Massachusetts, U. S. A.

Cold Rolling of Narrow Strip and Its Equipment Requirements

By R. J. Wean,
of the Wean Engineering Co.,
Warren, Ohio.

The data from which this article was prepared was furnished by the Broden Construction Company, subsidiary of the Wean Engineering Company, Inc. The Wire History Facts mentioned are from the Year Book of the Iron & Steel Institute. ✦ ✦ ✦ ✦ ✦ ✦

Historical Facts:

HISTORY tells us, that of all the metals, iron was the earliest one known to man, the discovery of iron ore dating back to probably 14 centuries B. C. The Bible mentions Tubal-Cain as an "instructor of every artificer of brass and iron." The ancient Egyptians knew much about iron and steel. The Assyrians and Babylonians were skillful artificers in iron; the Greeks may have learned the art of ironmaking from them and they in turn passed it on to the Romans whose legions were armed with weapons shaped of wrought iron.

✦ ✦ ✦

WHEN the Romans invaded Britain nearly 2,000 years ago they found the natives working iron in primitive forges.

✦ ✦ ✦

FOR centuries strip-like sections of metal were produced by hammering until finally somebody discovered that much better results could be obtained by passing the metal between two rotating rolls.

✦ ✦ ✦

LEAD sheet or strip was rolled in Italy in Leonardo Da Vinci's time around 1495. Mills for rolling mint-flats were in use in Spain and Italy during the 16th century. French documents describe a reversing mill for rolling lead into sheets in use in France in 1728. In Germany the beginning of the cold rolling of iron and steel as an industry may be said to date from about 1830, as at that time we find reports of the manufacture and use of steel reeds by the weavers. In England in 1854-55 cold rolled sheet was produced presumably for steel pens and clock springs.

✦ ✦ ✦

RECORDS have it that in the United States the first iron works were located near Lynn, Massachusetts, and were built between the years of 1643 and 1645.

✦ ✦ ✦

BY 1800 the cold rolling of metals was in general use for iron, steel, brass and copper.

✦ ✦ ✦

IN 1801 Paul Revere set up a mill and successfully cold rolled sheet copper which was used on the historically famous CONSTITUTION.

✦ ✦ ✦

THE cold rolling of brass was done at Waterbury, Connecticut between 1802 and 1808.

✦ ✦ ✦

IN 1859 round wire was flattened between rolls in Worcester, Massachusetts.

✦ ✦ ✦

LATER, widths wider than could be rolled from round wire were produced from flat rods rolled by rod mills: STRIP STEEL WAS BORN.

✦ ✦ ✦

IN 1872 or 1873 the first strip steel was rolled at Pittsburgh and by 1878 the first strip steel was rolled for the market.

IT is noteworthy that among the early uses of strip steel we find frames for ladies' hats, hoops for the old style hoop skirts, corset stays, shoe shanks and clock springs.

✦ ✦ ✦

DURING the 300 years elapsed since that humble beginning at Lynn, American ingenuity has created a mighty empire in the steel industry of our day, destined to shape the future of our nation.

✦ ✦ ✦

IN the art of making and shaping steel the modern way, the most interesting part is, no doubt, the process of cold rolling in its many phases. We may admire an antique museum piece of wrought iron beautifully forged by the skillful hand of a famous craftsman, but what about that ribbon of steel, a mile long or more, reduced in thickness to a mere few thousandths of an inch and of mirror finish!

✦ ✦ ✦

POWERFUL machinery and clever devices of many designs have made it possible to produce strip steel in enormous tonnage to meet an evergrowing demand for the manufacture of modern commodities. We are indeed living in an age of steel!

✦ ✦ ✦

IT is well known that the advantages of cold rolling are: dimensional accuracy, surface finish and physical properties. Under the classification of narrow cold rolled strip, we place anything from flat wire up to 24" wide strip.

Equipment Requirements:

THE development of equipment for producing cold rolled strip is equally as interesting as the improved product itself. What a vast difference between those old mills with babbitt bearings, wrench operated screwdowns, rope or belt drives off a steam engine and these modern high speed mills with anti-friction bearings, motorized screwdown mechanism and variable speed electric motor drives.

✦ ✦ ✦

THE equipment builders rightfully deserve a lot of credit for their part in the production of today's high quality cold rolled strip. In reviewing the equipment involved for the production of narrow strip steel one might well begin with the **pickling process.** While it was formerly common practice to pickle in coil form, having previously pulled the strip through a scale breaker and opened up the coils by "back-spinning," most mills now have installed multiple strand continuous picklers, handling from six to twelve strips at a time. The advantages of this latter way over the pickling in coils is generally acknowledged as being quicker and more uniform.

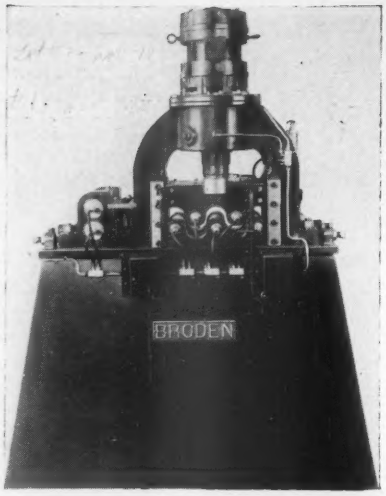


Fig. 474. Scale Breaker ✦ ✦ ✦

✦ ✦ ✦

PULLING the hot rolled strip first through a SCALE BREAKER (Fig. 474) of five rolls of reasonably small diameter, with the top and bottom rolls spaced such that they may pass each other to a point where they can be brought in line, the scale is cracked sufficiently to reduce the subsequent pickling time 35 to 50 per cent. Subjecting the strip to a series of severe reverse bents between the breaker rolls also has a beneficial effect on the grain structure eliminating crossbreaks

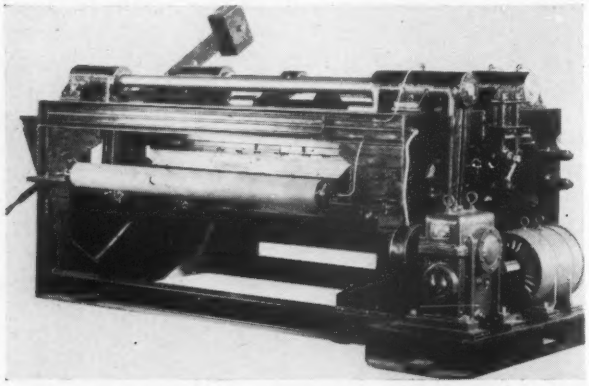


Fig. 454. Rotary Brushing or Scrubbing Machine ✦ ✦ ✦

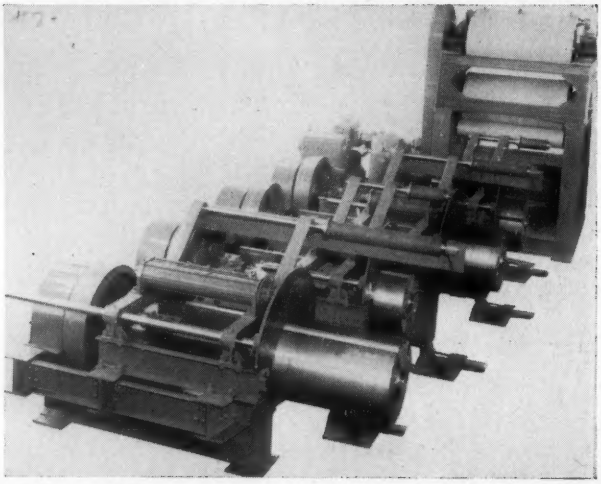


Fig. 401. Pull-Out Rolls ✦ ✦ ✦ ✦ ✦ ✦

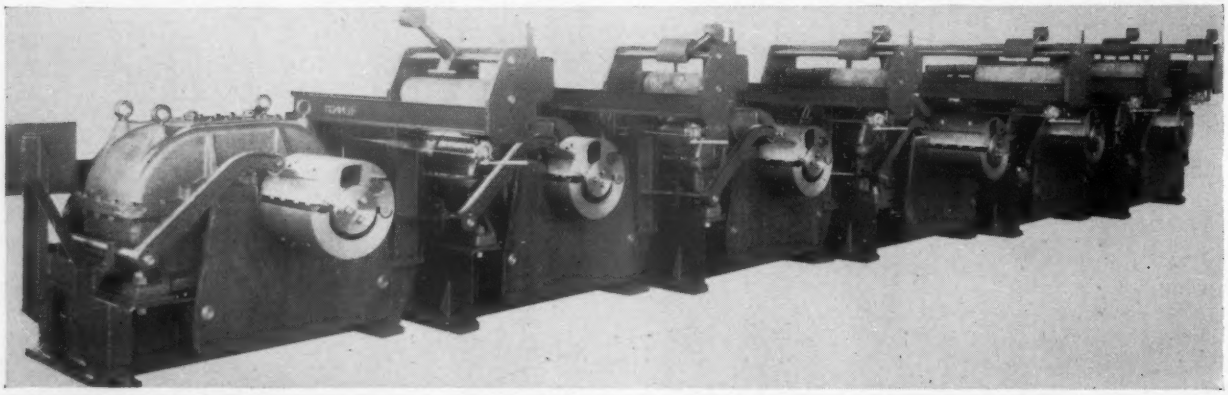


Fig. 439. Individual Motor Driven Take-Up Reels ✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦

during the uncoiling for further processing. Placed in line with the payoff reel, the breaker and the recoiling reel is generally a shear for squaring the ends. There may also be a punch-press for punching holes in the ends when I——I-shaped links are used for connecting the coil ends together while passing through the pickling outfit. This same punch-press can also be used for blanking out these connecting links.

✦ ✦ ✦

INSTEAD of the above method for connecting the coils, the ends may be welded together by means of an electric spot welder.

✦ ✦ ✦

AT the entry end of a continuous pickler, narrow strips are generally uncoiled on flat floor reels while the wider coils are placed in coil boxes or on horizontal drums.

✦ ✦ ✦

FOR the construction of the acid vats and water-tanks cypress timber was used almost exclusively because of its durability. Many tanks were built of concrete lined with acid-proof brick. More recently tanks of all steel welded construction with rubber lining and a layer of acid-proof brick for added protection are used to a great extent.

✦ ✦ ✦

GRANITE sinker-rolls, which at one time were in common use for acid vats, are now replaced by rubber covered steel rolls. Neoprene, a synthetic material is gradually replacing natural rubber for this application.

✦ ✦ ✦

ROTARY brushing or **Scrubbing Machines** (Fig. 454) are used in some installations, particularly on stainless or copperclad steel for removing smudge or other foreign matter before drying the strip. Uniform pickling is no doubt affected by the rate of speed of the strip through the tanks hence fairly constant speed is essential. This is accomplished by means of PULL-OUT ROLLS which deliver the strip to the TAKE-UP FRAME (Fig. 401) at a uniform rate of speed.

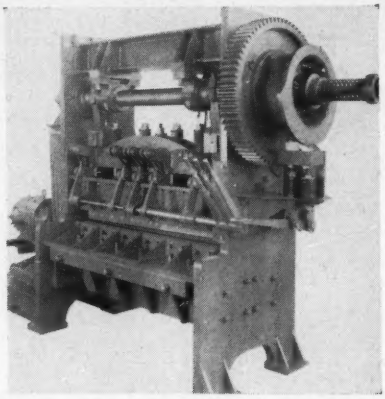


Fig. 395. Multiple Gang Shear ✦ ✦

A MULTIPLE block take-up frame designed to handle say light strands of 8″, will also handle four strands up to 16″ or two strands up to the maximum width used. To compensate for speed differential through coil build-up, a slip friction device in the form of an oversize clutch can be used, if all blocks are driven off a line shaft through bevel gearing, roller chains or individual speed reducers coupled in line and powered by a single motor which also drives the pull-out rolls. If alternating current only is available, a variable speed transmission can be used for obtaining the three or four to one speed range.

✦ ✦ ✦

IF direct current is available, the drive is somewhat simpler as only a D. C. adjustable speed motor is required.

IF initial cost is not of prime consideration, individual motor-driven **Take-up Reels** (Fig. 439) are often used with variable voltage set up, the strip speed range being obtained by field control and coil build-up speed reduction by voltage regulation through a rider-roll in contact with the coil. Pull-out rolls are not required with this type of installation.

✦ ✦ ✦

SPOTWELDED coils must be cut at the take-up reels and for widths up to 8 or 10 inches, a small electric or air-operated alligator shear or even a hand shear will do; but for the wider strip and particularly the heavier gauges a multiple **Gang Shear** (Fig. 395) placed in line is recommended.

✦ ✦ ✦

SINCE it is important to keep the oncoming strip moving, the quick removal of the finished coils from the blocks is essential. This is accomplished by the use of quick acting air-operated coil pushers located at each block. Blocks are generally of 16″ diameter, of the expanding type, either hand-operated by crank, or entirely automatic.

✦ ✦ ✦

GOOD pickling is the first step in the process of producing quality cold rolled strip and the pickling department deserves the most careful consideration.

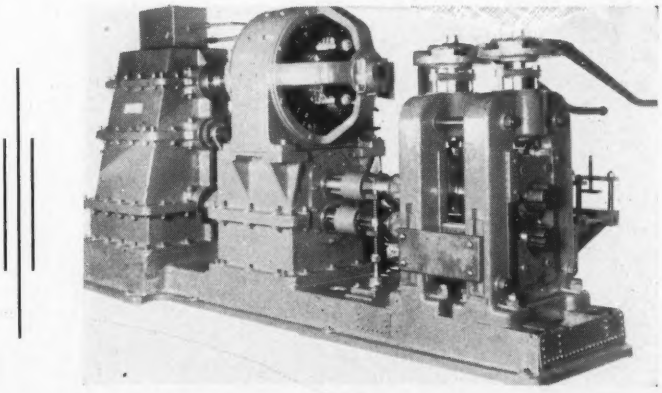


Fig. 162. Two-Hi Cold Rolling Mills ✦ ✦ ✦ ✦ ✦

Cold Rolling:

IN the earlier days **Two-Hi Cold Rolling Mills** (Fig. 162) were almost exclusively used for the cold rolling of narrow strip steel. As the art of cold reducing became more popular, the demand for greater reductions per pass brought about new and revolutionary developments in mill construction. Advancements in the metallurgy of alloy steels went hand in hand with the making of rolls of great hardness and high finish, rolling a strip that could hardly be produced with the former chilled iron rolls.

TWO-HI mills may be operated singly or in tandem fashion.

✦ ✦ ✦

THE once common **Coil Boxes** for holding the coils are being gradually replaced with **uncoiling reels** (Fig. 514) equipped with drag-brakes providing back tension. Hydraulic power is more and more used for operating expanding type blocks on these reels and for elevating coils of ever increasing weight.

✦ ✦ ✦

WITH the invention of the four-hi mill and subsequently

strand lines should not remain unmentioned. Special alloy steels are mostly handled in this manner. Very narrow strips up to ½ inch are recoiled on special traverse reels making a virbrated or **threadwound coil**, (Fig. 511). Equipment for coiling narrow strip in connection with a continuous tempering process is constructed along similar designs (Fig. 494).

✦ ✦ ✦

UPCOILERS (Fig. 412) and DOWNCOILERS (Fig. 410) find their application in installations handling the wider strip.

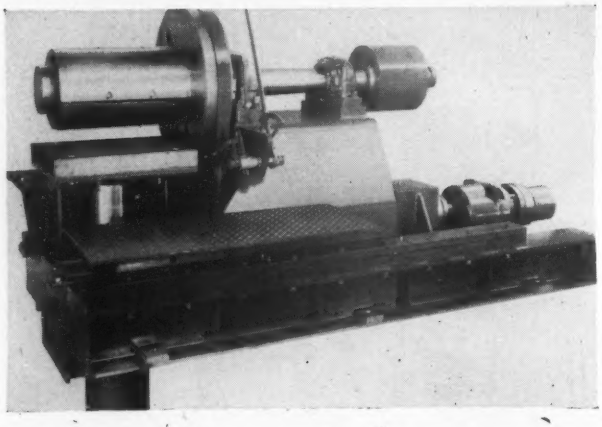


Fig. 514. Uncoiling Reels ✦ ✦ ✦ ✦ ✦ ✦

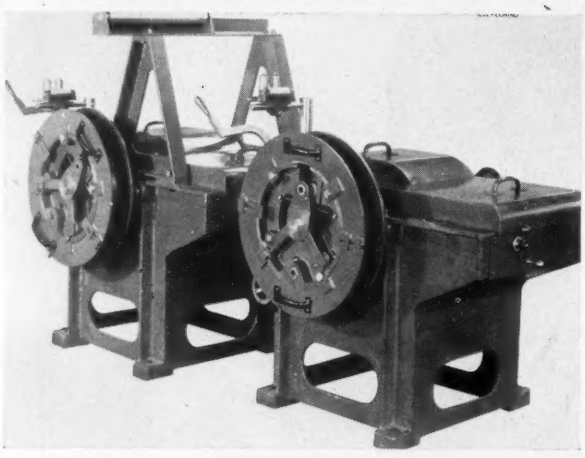


Fig. 511. Special Traverse Reels ✦ ✦ ✦ ✦ ✦

GREATER reductions per pass gave increased roll pressures and higher bearing loads, all of which caused the manufacturers of anti-friction bearings to bring out roller bearings of suitable capacity.

the cluster-mill, the reversing high speed mill had made its debut.

✦ ✦ ✦

WHILE equipment for annealing of strip steel in coil form is in common use, continuous annealing and cleaning multiple-

STRIP reels to operate in connection with cold rolling mills may be driven off the mill through a friction slip clutch to compensate for the speed differential caused by the coil build-up or they may be of the direct motor driven type with constant tension con-

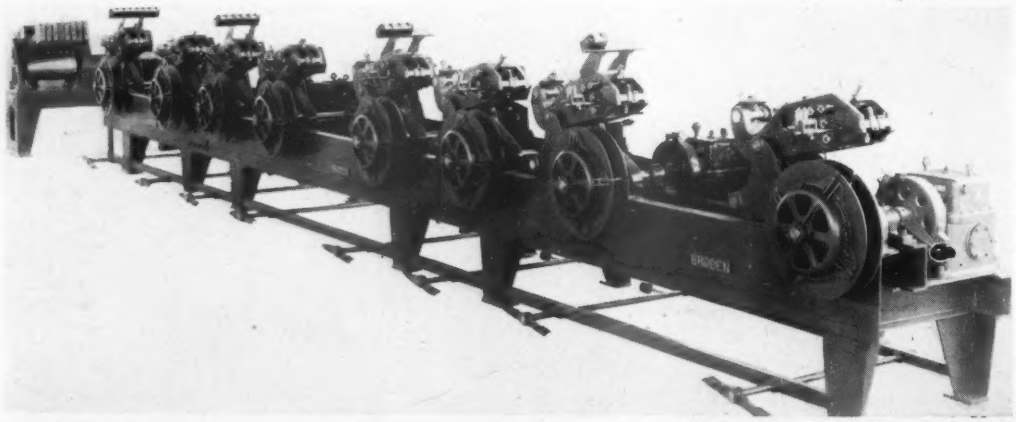


Fig. 494. Equipment For Coiling Narrow Strip in Connection With A Continuous Tempering Process. ✦ ✦

(Please turn to Page 317)

Glass Processing Wire and Steel Products

By John J. Caugherty

It is the purpose of this paper to bring to the attention of Wire and Steel Products Manufacturers, new methods of major importance, which will eliminate the use of acids in cleaning methods, improve the quality, increase production, at reduced costs, and savings in metal loss. The new methods cover hot rolling, cold drawing, galvanizing, and heat treatments, such as annealing, patenting, etc., with de-oxidization in one continuous operation. ✦ ✦

THERE have been various attempts to eliminate acid cleaning operations by mechanical means, meeting with little or no success, due to the fact that in the hot rolling operations, scale or oxides are rolled into the surfaces, that no amount of deforming or brushing will entirely eliminate.

✦ ✦ ✦

IN the rolling of rods, the billet being heated and soaked through temperatures up to 2300°F. has a very heavy scale formed on it, but in passing through the first and second roughing passes, this heavy scale separates, a light secondary scale remaining throughout the remaining operation until the rod cools to temperatures where oxides again begin to form, and continue to form through the remaining cooling period.

✦ ✦ ✦

IT is known in certain heat treating practices, that if clean bright sections of steel are perfectly sealed against atmosphere through its heating and cooling cycles, no oxides will form. From this knowledge, research and experiments were conducted whereby ways and means could be developed to insulate steel surfaces from atmosphere exposure in continuous operation.

✦ ✦ ✦

THROUGH the co-operation and assistance of a large glass manufacturing firm, and later by a large steel and wire company, it was developed that in passing cleaned wire through a bath of molten glass, the coating deposited on the surface of the steel, while not entirely forming a 100% insulation, effected the desired results, inasmuch that, when the coating separated which is below oxidizing temperatures, it removed any oxides formed with it, effecting a bright cleaned surface, heat treated in the same operation.

✦ ✦ ✦

VARIOUS other experiments were conducted over a period of two years, on scaled and bright finishes on rod and wire, on low, and high carbon, stainless and other grades of steel to determine speeds of operation, correct types of glass, means of application, surface effects, length of immersion in the molten glass, metallurgical examination, etc.

✦ ✦ ✦

THE next step taken in this development was to determine correct type of furnace material, sinker bars, etc., that would give longest life at low cost of construction, and low maintenance costs; co-operation again was obtained through a large clay products company who have specialized in glass furnace construction.

✦ ✦ ✦

WHILE in the present writing these methods being only developed to wire products, and narrow widths of stainless steel strip, there is no reason to believe that they cannot apply to all grades of strip, sheet, and bar steel; future developments will determine this.

✦ ✦ ✦

AT this time the following practices are proposed:

METALLURGICAL EXAMINATION (STAINLESS STEEL)

Plate No.	Grade:	Dia.	T. S.	Elong. 2"	Red. of Area	Time Immersion	Temp. of Glass
8103	310 Hard Drawn	.135	203180 #	9.0%	45.53%	.....	.. ..
8107	310 Glass Processed	.134	110260 #	33.0%	65.14%	30 seconds	1900°F
8104	310 Glass Processed	.134	106780 #	35.5%	69.36%	1 minute	1900°F
8105	310 Glass Processed	.134	106780 #	35.5%	69.36%	2 minutes	1900°F
8106	310 Glass Processed	.133	106780 #	34.5%	68.54%	3 minutes	1900°F
8108	18–8 Hard Drawn	15½	246720 #	3.0%	56.21%	.....	.. ..
8109	18–8 Glass Processed	15½	115100 #	51.5%	76.45%	10 seconds	1900°F
8110	18–8 Glass Processed	15½	113440 #	49.0%	79.22%	20 seconds	1900°F

IT will be noticed that very little variation appears in time cycles in physical properties as shown; the length and temperatures of the glass bath will of course control speeds of production.

Plate No. 8103. Inv. #2611-1.

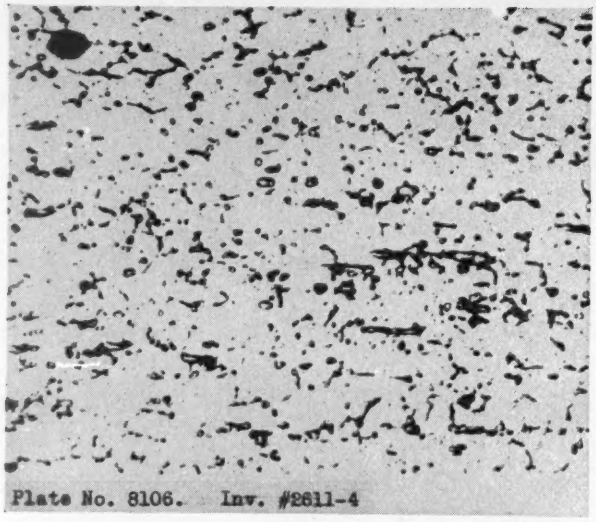


Plate No. 8106. Inv. #2611-4

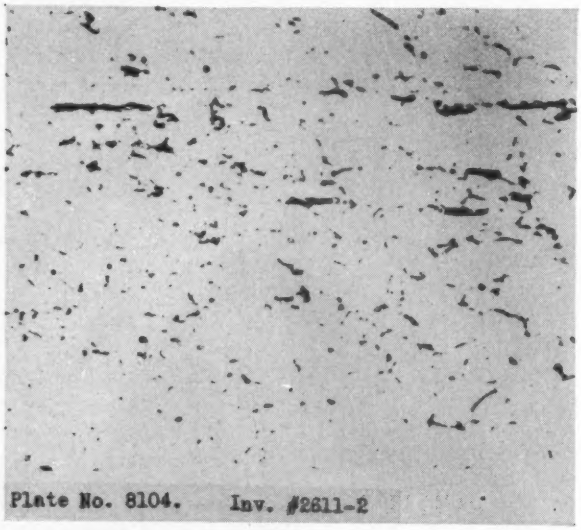


Plate No. 8104. Inv. #2611-2

Plate No. 8107. Inv. #2611-5

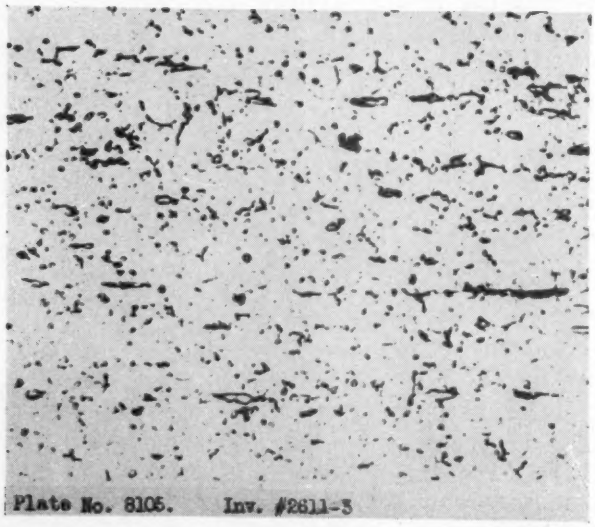


Plate No. 8105. Inv. #2611-3

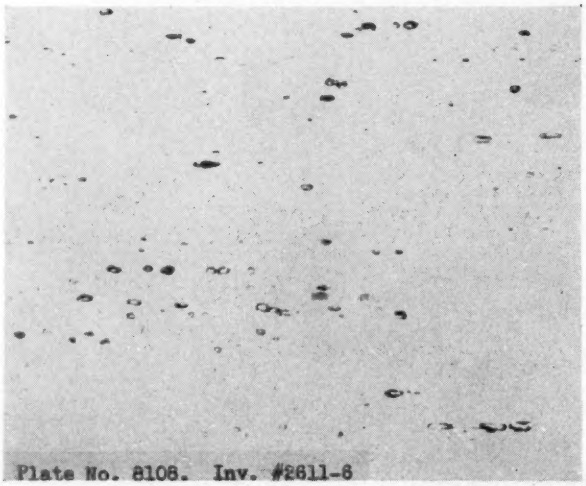


Plate No. 8108. Inv. #2611-6

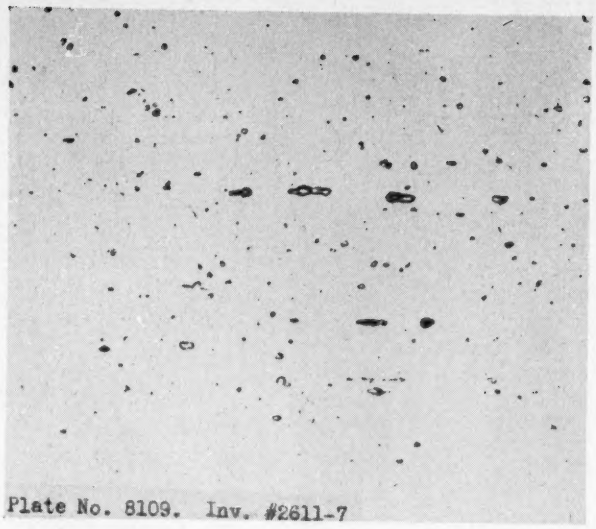


Plate No. 8109. Inv. #2611-7

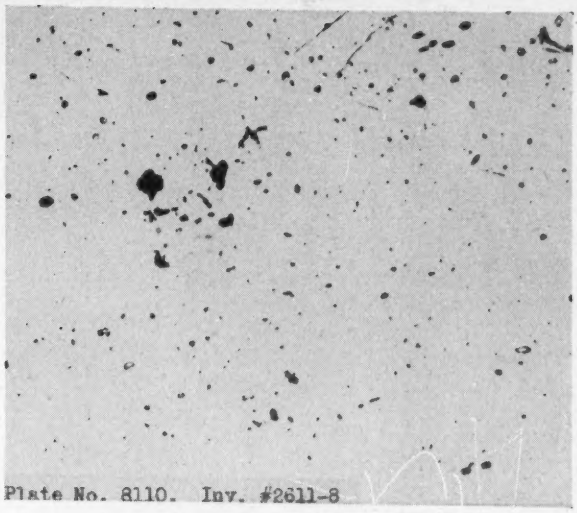


Plate No. 8110. Inv. #2611-8

Rod Rolling Practice

AS the hot rod exits from the finishing pass, or just as it enters the reel guide, spray guns are suitably located to spray molten glass (hot snow) on all surfaces. The glass coating will insulate the rod against further oxidation through its cooling temperatures. As the rod cools below oxidizing temperatures, the coating will separate from exposed sections removing what oxides are formed with it.

+ + +

IT is recognized in coiling the hot rod, the glass coating being in a partly molten state, will adhere together on unexposed sections. Separation of these strands in the wire drawing department will remove the coating and oxides on these sections, effecting a perfectly cleaned surface for drawing.

FOR economy reasons, and savings in metal loss, the coating containing the oxides should be collected and returned to the blast furnace.

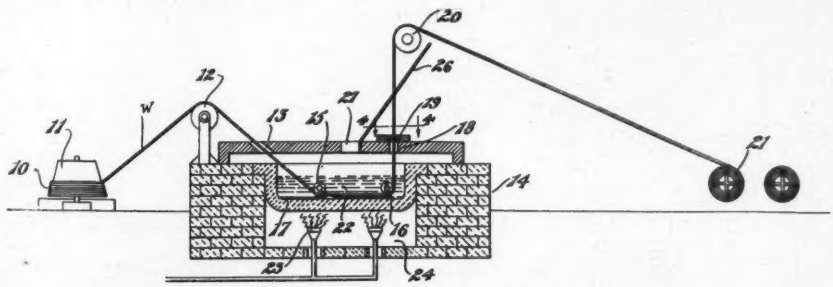


Fig. 1. Galvanizing. (See Patent 2,337,186)

+ + + + + +

Wire Drawing Practice

THE rod treated as of rod rolling practice is transferred directly to the wire drawing department, placed on a reel, passed over vertical and horizontal rolls or bars to assure all particals of coating and oxides are removed, pointed, passed through a container of quick drying coating to act as a carrier for drawing lubricants, and drawn as of regular practice.

+ + +

Galvanizing Practice

THE drawn wire as of wire drawing practice is transferred to the galvanizing department, placed on a reel passed through a container of molten glass, heated to approximately 2000°F.; at the exit of this container, die plates are located with openings 1/16 of an inch in diameter larger than the wire to be processed in order to obtain a thin uniform coating. The glass coated wire is passed over a roll located at a required distance to allow for cooling below oxidizing temperatures. At this point the glass coating separates, removing any oxides formed with it, effecting a perfectly annealed,

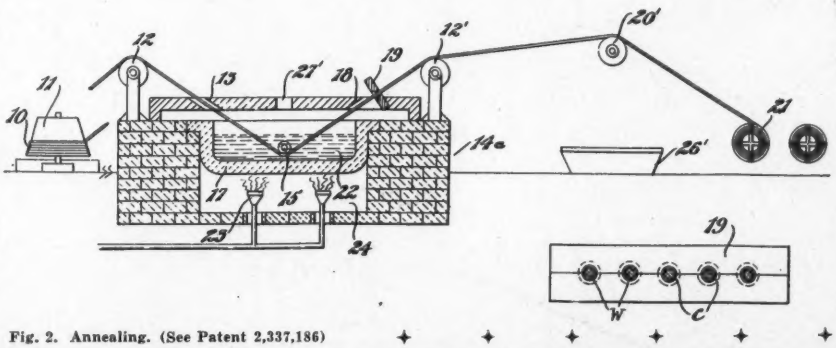


Fig. 2. Annealing. (See Patent 2,337,186)

+ + + + + +

clean surface, passing directly through a flux, into the zinc or spelter bath as of regular practice.

✦ ✦ ✦

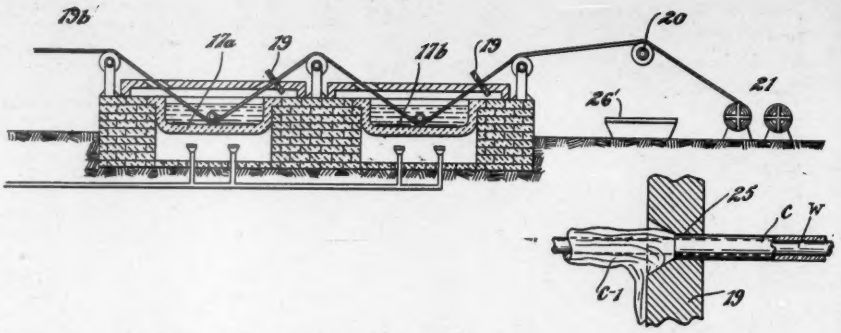
Annealing Practice — Stainless Steel—Ferrous Metals

THE drawn wire is transferred to equipment of continuous operation, placed on a reel, passed through a container of molten glass heated to approximately 2000°F. At the exit of this container die plates are located with openings 1/16 of an inch larger in diameter than the wire to be processed, passed over a roll located at a required distance to allow for cooling below oxidizing temperatures; at this point the coating separates removing any formed oxides with it, effecting a perfectly clean, annealed surface for further processing or shipment. A container of light, hot lime is located at the take up reels if for further drawing, or a container of protective coating if for shipment.

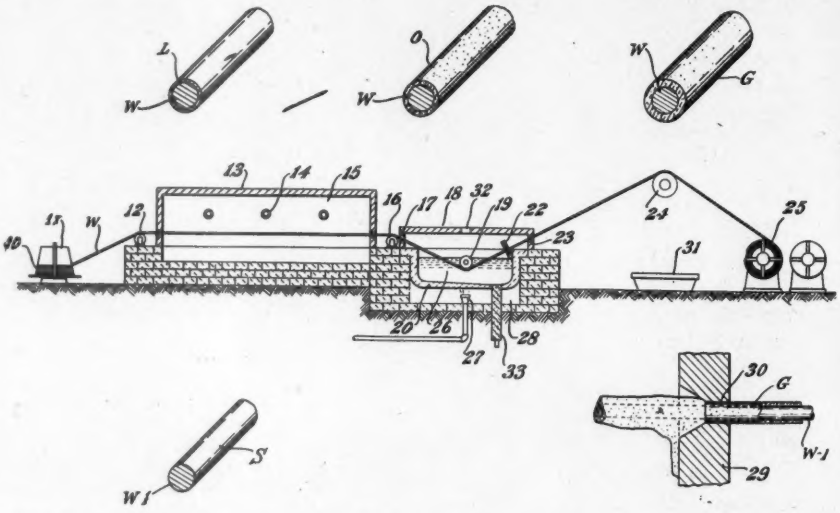
✦ ✦ ✦

Patenting Practice (Spring Steel)

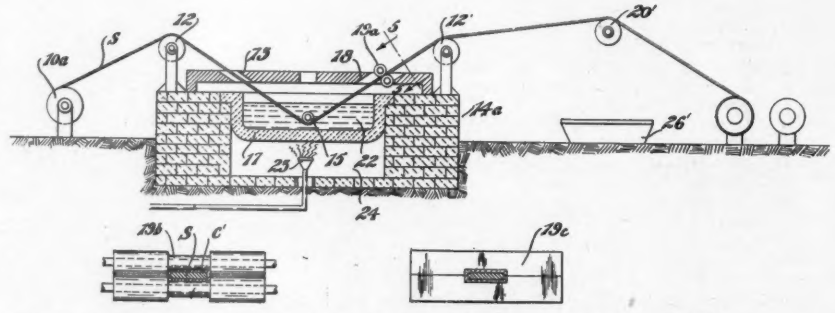
THE drawn wire is transferred to the patenting department, placed on a reel, passed through a short immersion of molten glass; die plates located at the exit with openings larger than the diameter of the wire to be processed, the wire leaving this bath a short distance (not of sufficient length to allow for cooling) into a second container of molten glass equipped with die plates at its exit 1/16 of an inch in diameter larger than the wire to be processed in order to obtain a uniform coating. The wire then passes over a roll located at a required distance to allow for cooling below oxidizing temperatures. At this point the coating separates, removing any formed oxides with it, effecting a perfectly cleaned surface with a patented structure; the wire passes through a container of hot lime at the take up reels, and is transferred directly to the wire department for drawing to spring or rope wire.



Patenting. (See Patent 2,337,186) ✦ ✦ ✦ ✦ ✦ ✦ ✦



Lead Coated Stainless Steel Annealing. (See Patent 2,337,185) ✦ ✦ ✦ ✦



Strip Steel. Refer to U. S. Patents Nos. 2,337,185, 2,337,186. 2,338,165 for detailed specifications. ✦

Lead Coated Stainless Steel Annealing

THE practice of lead coating this grade of steel for drawing operations, the expensive method of cleaning off this lead coating with acids for additional annealing or shipment is eliminated by the following practice, with complete recovery of the lead in metallic form.

THE drawn lead coated wire is placed on a reel, passed through a container of molten glass at the exit die plates, being located with openings 1/16 of an inch larger in diameter than the wire to be processed, passed over a roll located at a required distance to allow for cooling below oxidizing temperatures. At this point the coating separates removing the lead with it in metallic form, ef-

fecting a perfectly cleaned annealed wire for further processing or shipment. The coating containing the lead is returned to the glass container, a reducing agent added, the lead being recovered in metallic form, the glass being used over for an indefinite period of time.

✦ ✦ ✦

Strip Steel

THE same method as wire except that die hole must correspond to width and diameter of the strip. In this care must be taken that the glass does not fly in eyes. The glass separates violently due to flat surfaces.

✦ ✦ ✦

IT is recommended that the strip leaving the die or roll be passed through a closed hood to prevent the too rapid separation of the glass coating, and as a safety measure to operaters.

✦ ✦ ✦

Glass Process Methods Questions and Answers

Q.—How will the glass be applied on hot rolled rods, and at what points?
A.—By spraying either at the second roughing pass, or at last finishing pass.
Q.—What will prevent the strands from sticking together?
A.—This makes little or no difference as the strands will be separated on drawing.
Q.—What will be used as a carrier for drawing lubricants?
A.—An instant drying substitute for lime applied at the die box.
Q.—What means will be employed for positive removal of any adhering glass?
A.—Pass it around vertical and horizontal rolls at wire drawing frame.
Q.—What will prevent rescaling on heat treating such as patenting, etc.?
A.—The insulation of the glass coating through its cooling cycle.
Q.—Will the glass coating retard the cooling?
A.—No, as glass is a very poor conductor of heat.
Q.—What speeds of production can be obtained on rod rolling?
A.—No change in present practice, the spraying equipment being adapted to it.
Q.—What speeds of production on the patenting of spring steel?
A.—No change in present practice, except the elimination of furnaces. This applies also to the annealing of low carbon for galvanizing and stainless steel.
Q.—What about pot annealing?
A.—This can be done in the galvanizing department at increased production, and also replacing Lavite annealing.
Q.—What about normalizing?
A.—This can be done by continuous operation, the structure controlled by speeds of operation, and length of immersion in the glass, with positive elimination of any possible decarburization.
Q.—What is the cost of the glass, and estimated amount required per ton of steel?
A.—Cost of glass $18.00 per ton, and should process up to 100 tons of steel using it over three times.
Q.—What is done with the glass after it is of no further use?
A.—It is sent to the blast furnace for the recovery of the oxides.

✦ ✦ ✦

Instructions for Experimental Unit

THE furnace type number is 100S, serial No. 4, manufactured by the Monarch Engineering & Manufacturing Co., Baltimore, Maryland. Graphite crucible placed inside furnace is 12 in. in diameter, 16 in. in depth, manufactured by Vesuvius Crucible Co., Swissvale, Pennsylvania.

✦ ✦ ✦

PLACE glass compound in crucible, approximately 30 pounds; heat slowly for four to five days to prevent cracking of crucible, then heat to approximately 2,000 deg. F. It will be noted that the compound will foam at this temperature, when this ceases, add 10 pounds more of compound; when foaming ceases, add the final 10 pounds.

✦ ✦ ✦

AT the top of this furnace is an opening approximately 8 in. in diameter. Across this opening place die plate. This is a section of steel plate approximately 16 in. long, 3 in. wide, and ¾ in. in diameter. In this plate drill holes about 2 in. apart, counter sinking slightly on each side.

✦ ✦ ✦

WIRE 12 to 16 gauge drill hole 3/16 in. Wire 12 to 7 gauge drill hole ¼ in.

✦ ✦ ✦

WHEN the glass is to temperature, place a section of bright drawn wire, 12 gauge for instance, through the ¼ in. hole pushing it down into the glass. Allow to remain from 20 to 30 seconds and pull it back up through the die hole, allow to cool, bend slightly to remove coating; test.

✦ ✦ ✦

IF stainless steel that is lead coated, place through hole, holding it in the heat until it reaches a temperature of approximately 800 to 1000°F. Push into glass, allow to remain from 20 to 30 seconds. Bend slightly to remove coating. Test.

✦ ✦ ✦

NOTE: After pulling a section through the die hole, push the glass adhering to underside, back into crucible using another section of hard wire.

✦ ✦ ✦

For stainless and alloy steel obtain flint glass. For low carbon steel containing no silicon obtain flint glass. For high carbon and high silicon steel obtain soda lime or white bottle glass.

✦ ✦ ✦

Any glass manufacturer can supply this at approximately 2c per pound.

✦ ✦ ✦

Glass separated from wire place back in crucible. It can be used over for indefinite period of time.

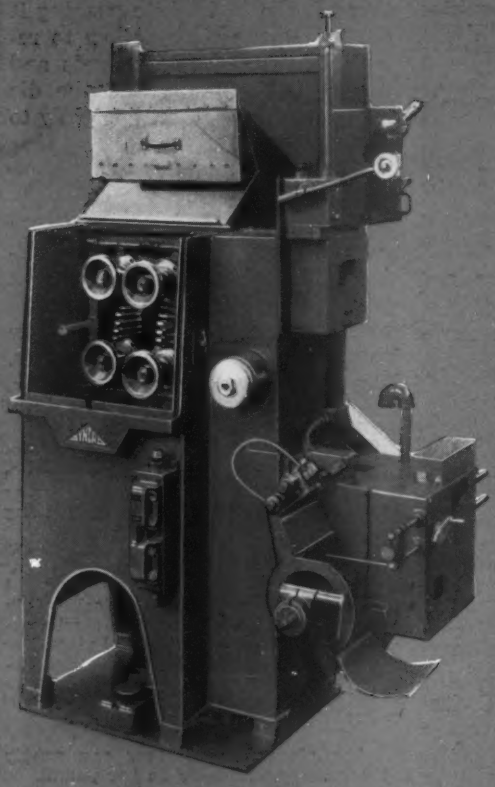
THE WIRE ASSOCIATION
ANNUAL CONVENTION
will be held at
CLEVELAND, OHIO
October 16–20, 1944
in association with the
National Metal Congress

✦ ✦ ✦

Wire Association Headquarters
will be the
Carter Hotel, Cleveland, Ohio
Make your plans to attend and send in your hotel reservation now to the Wire Association as there will probably be a shortage of hotel space.

✦ ✦ ✦

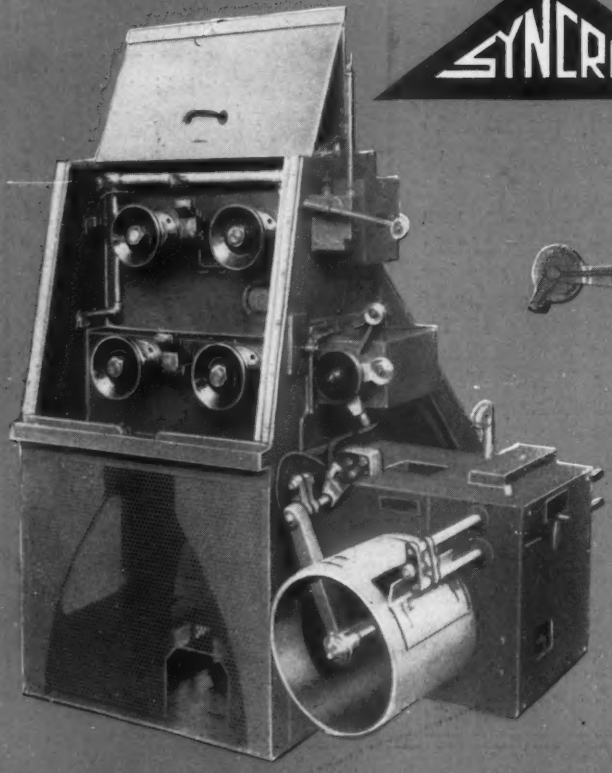
For detailed information address
RICHARD E. BROWN,
Exec. Secy.
THE WIRE ASSOCIATION
300 Main Street Stamford, Conn.



TYPE AA-14
Enter #26 B & S Ga.
Finish #40 to #46 B & S Ga.

TYPE A-16
Enter #16 B & S Ga.
Finish #30 to #38 B & S Ga.

SYNCRO



TYPE B-16
Enter #14 B & S Ga.
Finish #26 to #34 B & S Ga.

TYPE BC-14
Enter #10 B & S Ga.
Finish #24 to #34 B & S Ga.

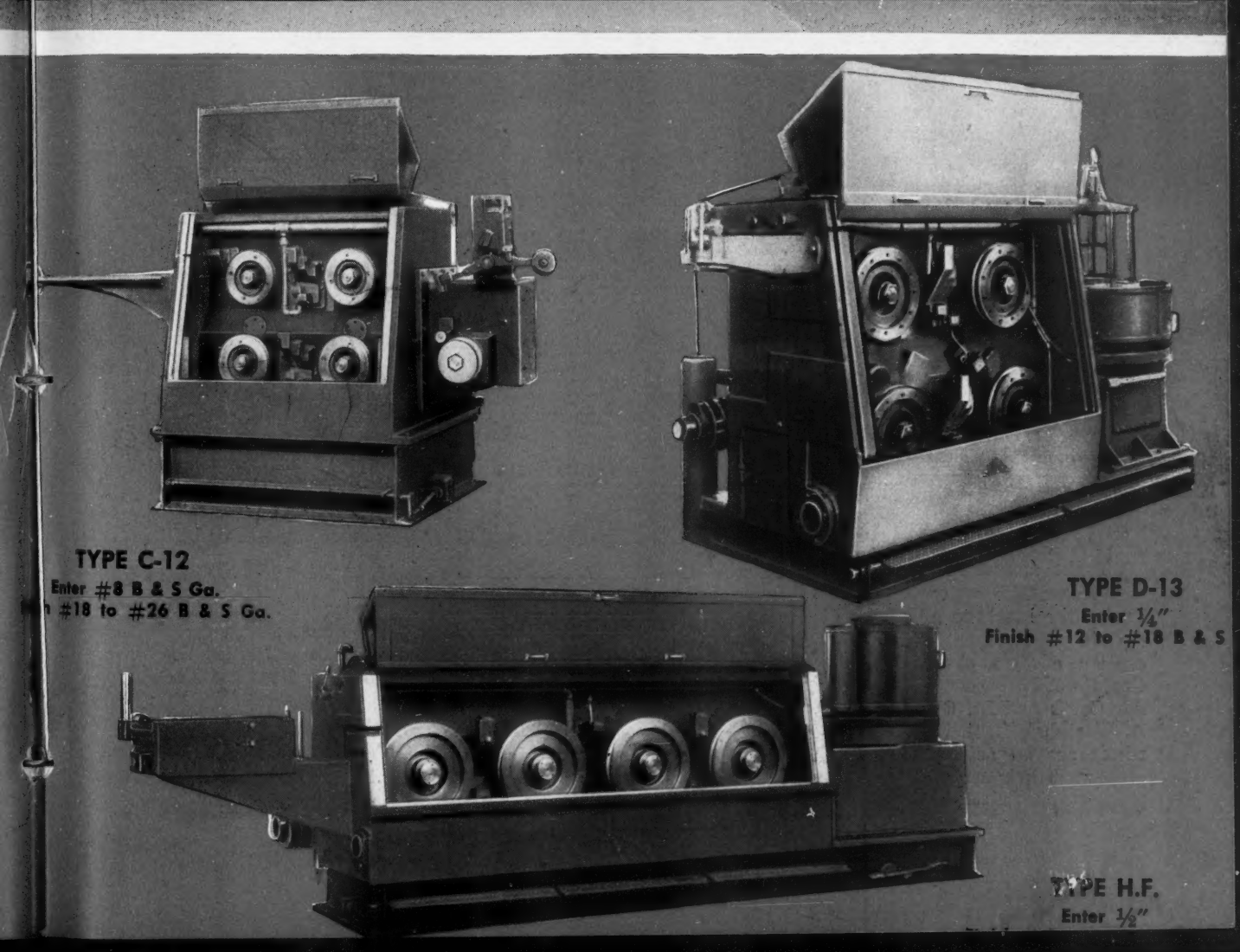
Here's what we mean... by a COMPLETE *line!*

Syncro non-ferrous wire drawing machines cover a complete range as illustrated. Also available, is a complete line of Syncro steel wire drawing machines and high speed Rodblocks.

In addition to wire drawing machinery, Syncro quality products include complete accessory equipment such as stranders, closers, capstans, coilers, re-reelers, re-spoolers, serving heads, insulating machinery, wire rope machinery, tinning machinery, etc. In fact, from the complete Syncro line, you can select exactly the equipment you need, with the full assurance that whatever equipment you select will fulfill your every requirement — now, and for many years to come.

SYNCRO MACHINE COMPANY RAHWAY, N.J.
McCORMICK BLDG., CHICAGO

Canadian Representative — Canadian Elevator Equipment Co., Ltd., Toronto



TYPE C-12
Enter #8 B & S Ga.
Finish #18 to #26 B & S Ga.

TYPE D-13
Enter ¼"
Finish #12 to #18 B & S

TYPE H.F.
Enter ½"

Wire Association Elects Officers For 1944-45

Decisions at Annual Directors' Meeting — Medal Award for 1943 — Programs for Regional Meetings — Committee Appointments — Data on Annual Convention.

POSSIBLY the largest group that has attended our annual Directors' Luncheon was present at the Waldorf-Astoria Hotel in New York on March 24th, 1944 on the occasion of the Directors' Meeting and Luncheon held on that date. The luncheon was a great success and everyone present was most enthusiastic about the splendid inspirational talks given by **Lt. Commander J. D. Gessford, U. S. N.** and the two navy veterans accompanying him, who had been in the Sicilian and South Seas Campaigns. Commander Gessford presented an entire program corresponding to a Navy Inspiration Rally as presented at an industrial plant; including the experiences of the veterans. He presented this to show how such a program would work in a meeting of the plant employees and tend to inspire them with real interest in the war effort.

✦ ✦ ✦

FOLLOWING Commander Gessford's program the motion picture **"Battle for the Beaches"** was shown and proved to be a dramatic climax to the talk, giving an idea of the vastness and complexities of the effort required to hold a beachhead and also some of the problems attendant upon such military operations.

✦ ✦ ✦

AT the annual meeting of the Board of Directors which preceeded the luncheon all of the directors were present with the exception of two past presidents: Captain J. K. Beeson of the Army Air Corps and Lt. Commander F. A. Westphal, U. S. N. R., both of whom are on active duty which prevented their attendance.

Proceedings at the Directors' Meeting

FOLLOWING the presentation of the annual report of the secretary and treasurer, which was unanimously ordered approved, and which showed the Association had a small surplus on hand for the first time in its history, reports were presented relative to the various planned activities of the Association for the year.

✦ ✦ ✦

THE Committee on the Worcester Regional Meeting reported that this meeting would be in the form of a dinner with a technical session following the dinner. The Guest Speaker to be **Rear Admiral Watt Tyler Cluverius,** U. S. Navy Retired, President of Worcester Polytechnic Institute, and the technical speaker to be **Matthew J. Donachie,** Technical Director of Production for the Beryllium Corporation of Pennsylvania, Reading, Pa. Arrangements have also been made with the Navy Department to show two recent action navy motion pictures. The meeting was set for April 14th at the hotel Bancroft, Worcester, Mass. with a registration fee of $3.00 per person including the dinner.

D. D. BUCHANAN
Manager of Operations,
Union Drawn Steel Div., Republic Steel Corp.
President—The Wire Association

Associated with Union Drawn Steel for past eighteen years. He has served in present capacity as manager of operations since 1939. During period 1930-1939 assistant general manager, and prior to 1930 manager of No. 3 plant at Beaver Falls. He started at Cambria Steel Company, Johnstown, Pa., in open hearth and rolling mills departments. Later he was connected with Jones & Laughlin Steel Company, South Side, Pittsburgh, Pa., and with See-Seldon, industrial engineers, in Pittsburgh.

✦ ✦ ✦

MR. **ROLAND M. HUSSEY,** Supt. of the Wire Dept. of Jones & Laughlin Steel Corporation of Aliquippa, Pa., Chairman of the Pittsburgh Regional Meeting Committee reported that the subject of the meeting would in general relate to new processes for use in cleaning house operations to obviate the feeder line and to develop various kinds of finishes on the wire.

✦ ✦ ✦

IN addition there is to be a dinner speaker and to close the meeting the navy film entitled "Seabees — The Navy's Fighting Construction Men in Action."

✦ ✦ ✦

THE meeting will be held at the William Penn Hotel, Pittsburgh, Pa., Friday, May 19th with a registration fee of $4.00 including the dinner; or a fee of $2.00 for those not attending the dinner but only the technical session following it.

✦ ✦ ✦

THIS idea of a separate registration fee for the technical ses-

sion is something new in our Association meetings and it will be interesting to see how it works out.

✦ ✦ ✦

FOR the annual convention in October **Mr. E. W. Gundstrom,** Asst. Plant Manager of the Rome Cable Corporation, Rome, New York, the Chairman of the Program Committee, reported that several non-ferrous papers had already been arranged for and one or two papers selected for the ferrous division. Mr. Gundstrom advised that he was now busy with the formation of his Committee and would have definite progress to report within the next three or four weeks.

✦ ✦ ✦

FOR the Pacific Coast Meeting Mr. Brown reported that **Mr. A. R. Zapp,** Manager Firthaloy Division, Firth-Sterling Steel Company, McKeesport, Pa. would act as Chairman of the meeting and that the topic of the meeting would relate to the results of recent research work in their laboratories. Cooperating with Mr. Zapp will be Mr. K. H. Davis, President of the K. H. Davis Wire & Cable Company of Los Angeles, California; Mr. Emerson Spear, Vice President of the Pacific Wire Rope Company, Los Angeles, California and Mr. Harry T. Hartwick, Service Engineer of the Firth-Sterling Steel Company of Los Angeles.

✦ ✦ ✦

THE meeting is scheduled to be held at Los Angeles, California, early in June.

✦ ✦ ✦

Election of Officers

THE new directors seated at the meeting were:

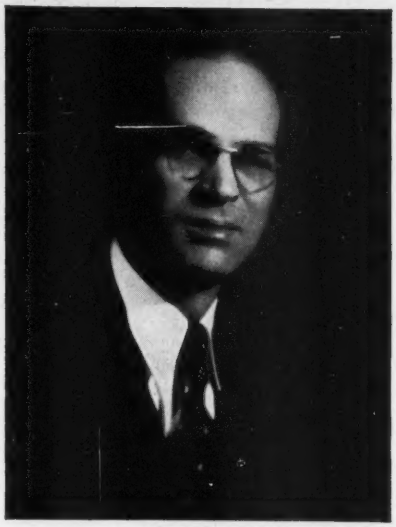
Kenneth H. Davis, President,
K. H. Davis Wire & Cable Company,
Los Angeles, California, and
Flint C. Elder, Research Engr.,
American Steel & Wire Company,
Cleveland, Ohio.

✦ ✦ ✦

FOLLOWING the seating of the new Directors the annual election of officers was held with the following result:

President—D. D. Buchanan, Manager of Operations,
Union Drawn Steel Division,
Republic Steel Corporation,
Massillon, Ohio

Medal Award For 1943



JOHN C. AIKEN

John Connell Aiken was born in Pittsburgh, Penna., on May 18th, 1895. He attended grade and preparatory schools in Pittsburgh and graduated from Washington & Jefferson College in 1916 with a Bachelor of Science Degree. He served in World War I in the U. S. Navy, Mine Laying Squadron aboard the U.S.S. Housatonic and later aboard a troop transport after the Armistice. From 1919 to 1923 he was employed by Oliver Iron & Steel Corporation of Pittsburgh in the bolt and nut business. He became associated with the Jones & Laughlin Steel Corp., Rod & Wire Department in 1923, becoming Rod Mill General Foreman, which position he held until 1935 when he became Asst. Superintendent, Rod & Wire Department. Mr. Aiken is a member of the Wire Association.

✦ ✦ ✦

Awarded Honorable Mention For 1943

E. J. CRUM

E. J. Crum was born in Virginia, Illinois, January 5th, 1909. Graduated from Missouri School of Mines in 1929 with a B.S. in Metallurgical Engineering. Entered the employ of Bethlehem Steel Company in 1929. Engaged in experimental and development work on Bethanized wire from 1933 to 1937 at which time he became General Foreman of Bethanizing and Galvanizing Departments, Rod and Wire Mills, Sparrows Point Plant.

Vice-Pres. R. M. Hussey, Supt. Wire Dept., Jones & Laughlin Steel Corp., Aliquippa, Pa.
Vice-Pres. E. W. Gundstrom, Asst. Non-Ferr. Plant Manager, Rome Cable Corporation, Rome, N. Y.
Exec. Secy. R. E. Brown, Publisher, WIRE & WIRE PRODUCTS 300 Main Street, Stamford, Conn.

✦ ✦ ✦

A VOTE of appreciation was extended to **Carl Johnson,** the retiring president for the splendid work he did for the Association during the two years in which he headed its activities.

✦ ✦ ✦

Medal Award

IN accordance with the resolution passed two years ago the Medal Award was made on the basis of papers submitted during the year 1943 and presented at the various meetings or published in WIRE AND WIRE PRODUCTS as a contribution to the Association. The Medal Award for the year 1943 was made to **Mr. John C. Aiken,** Asst. Supt. of Rod & Wire Dept., Jones & Laughlin Steel Corporation, Aliquippa, Pa. for his paper on the subject of "Drawing High Speed Rope Wire," and Honorable Mention went to **Mr. E. J. Crum,** Foreman Wire & Rod Division, Bethlehem Steel Company, Sparrows Point, Md., for his paper entitled, "The Graphical Solution of the Wire Mill Mathematical Problems."

✦ ✦ ✦

Annual Luncheon at the 1944 Convention

IT was decided to hold the annual luncheon as usual and this year a well known speaker of national reputation will be secured to discuss topics of current national interest. In addition to the speaker, military or naval motion pictures will be shown at the conclusion of the luncheon.

✦ ✦ ✦

Smoker

AT the Directors Meeting it was decided to hold the Smoker Dinner as usual and **Mr. A. R. Zapp,** of the Firth-Sterling Steel

(Please turn to Page 312)

✦ GOVERNMENT WIRE PRODUCTION INFORMATION ✦

Wire Fabrication Price Control

SALES of services that contribute to the fabrication or insulation of wire, cable and cable accessories will be priced according to provisions of the regulation establishing prices for the finished wire and cable products, the Office of Price Administration has announced.

✦ ✦ ✦

THIS action, which became effective March 18, 1944, fixes maximum prices for fabrication services not to exceed the net price the supplier had in effect for a similar operation on October 15, 1941, or on the latest date within six months prior to that time.

✦ ✦ ✦

FORMERLY there was specific control of prices for rolling and drawing copper into wire, but no specific control for fabrication services. Including the service charges in the wire and cable regulation will provide a specific pricing method where the copper wire is furnished to manufacturers for further processing for the supplier.

✦ ✦ ✦

Copper Reverts to Scarcity Class

COPPER no longer occupies the position of easy supply reported only a few weeks ago.

✦ ✦ ✦

A CHANGE in battle plans and conditions has brought about this change in the metal's status. Its place on our list of surpluses has become uncertain and insecure. The reason?

✦ ✦ ✦

COPPER has been diverted from a satiated small-arms program to the more urgent artillery requirements. An apparent excess, instead of being made available for civilian use, will have to continue under administrative control.

✦ ✦ ✦

IN fact, the diference between the amount of copper available to the United States and the military requirements is too small to presage a safe and secure condition during 1944. Indeed, this margin is so small that it may be dissipated in a few short months because of manpower shortage both here and abroad, and because of delays in the transportation of both imports and exports.

✦ ✦ ✦

AND so it goes. Today it is copper. Tomrorow some other metal or mineral now in a short or

MICROMETER PRECISION MICRO-WELD TRADE MARK REG. U. S. PAT. OFF.

CONTINUOUS IMPROVEMENT

MICRO-WELDERS with dial indicating annealing attachments are now available for high carbon wire.

There is positive control of annealing temperature and already hundreds of these special MICRO-WELDERS are proving their dependability and satisfactory performance with leading manufacturers.

Model E.-I-S Welder Capacity .010 to .062" high & low carbon wire.

MICRO PRODUCTS COMPANY

20 NORTH WACKER DRIVE, CHICAGO 6, ILL.

Telephone, State 7468

a long position, or not classified as even essential, may find itself in extreme demand.

✦ ✦ ✦

WPB Now Requiring Reports On Copper-Base Scrap Stocks of Over Twenty-five Tons

THE requirement for reporting the generation or accumulation of more than 5,000 pounds of copper and copper-base alloy scrap has been eased to require reporting only more than 50,000 pounds.

✦ ✦ ✦

COMPANIES which generate or accumulate less than 50,000 pounds are no longer required to file WPB Form-452 although they must continue to comply with the provisions of Copper Order M-9 requiring the disposal of all scrap in excess of a 30 days' accumulation unless such accumulation aggregates less than 10,000 pounds.

✦ ✦ ✦

WPB Removes Restrictions On Manufacture of Barbed Wire and Woven Wire Fence

THE War Production Board has announced removal of restrictions on the manufacture of barbed wire and woven wire fence. This action was taken by the revocation of Schedule 3 to Limitation Order L-211 which stringently restricted the guages and types of wire fencing that could be produced.

✦ ✦ ✦

THE necessity for these restrictions has passed as the types of steel required for these products are not in as heavy demand for the direct war program. There will be practically no increase in manpower demands since this revocation will result chiefly in transfers of labor from one type of operation to another. At any rate, any increase in volume would result in very few additions to labor forces.

✦ ✦ ✦

THE revocation of this schedule will permit the manufacture of heavier guages and a return to standard weights of zinc coating. The heavier guages are needed to properly confine hogs and cattle

(Please turn to Page 310)

NORBIDE ABRASIVE

"Saves Time and Money"

So Reports

Prominent Die Maker

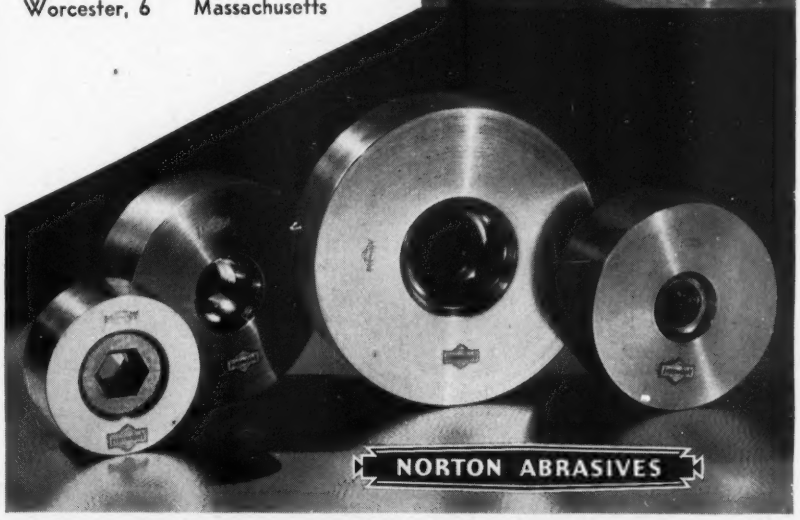
"In the drilling and ripping of large dies #220 Norbide abrasive grain has replaced the use of silicon carbide with great economy in time and expense.

"Number 320 F. Norbide abrasive grain has eliminated the use of diamond powders in the lapping and semi-polishing operations with equal success.

"In the drilling of small dies up to the point of 'breaking through' Norbide abrasive has proved even more effective than diamond powder."

NORTON COMPANY

Worcester, 6 Massachusetts



A Combat Correspondent making "rounds" on a former Jap-held island in the Solomons. WIDE WORLD PHOTO

Chain by S. G. Taylor Chain Co., Hammond, Ind.

Often aided by Chains made from

KEYSTONE Wire

As one soldier said . . . "A Jeep is a hybrid cross between a mountain goat, an army mule, and a water bug . . . just point its nose where you want to go and it'll get there!"

When the going gets *really* tough, special tire chains made from Keystone wire help the Jeep grab a surer footing. This is one of the *thousands* of war uses for Keystone wire—including many parts of the Jeep itself.

When war pressure is lifted, Keystone wire will again become available for civilian production . . . in a bigger and better way. *Significant new uses* for wire will help many wide-awake manufacturers "get the jump" in the postwar civilian market.

KEYSTONE STEEL & WIRE CO.
PEORIA 7, ILLINOIS

Special Analysis Wire for All Industrial Uses

SAMSON SPRING WIRE

Sell your SCRAP and buy WAR BONDS

Government Wire Production Information

(Continued from Page 309)

and the standard zinc coatings will result in lengthening the life of the product.

✦ ✦ ✦

Precision Mechanical Spring Industry Advisory Committee of the WPB February Meeting

THIS Committee, composed of Fuller F. Barnes, Wallace Barnes Co., Bristol, Conn., Albert Ritzer, Jr., Illinois Coil Spring, Chicago, Ill., Edward Byrnes, Wickwire Spencer Corp., New York, N. Y., Henry Frontroth, Cleveland Wire Spring Co., Cleveland, Ohio, Jack Culbertson, Duer Spring Company, McKees Rocks, Pa., E. W. Feldt, Raymond Manufacturing Co., Corry, Pa., Lawrence Humason, Humason Manufacturing Co., Forestville, Conn., Lee Johanson, Lee Spring Company, Brooklyn, N. Y., Warren A. Peterson, William D. Gibson Company, Chicago, Ill., and C. M. Young, L. A. Young Spring Company, Detroit, Mich., met in Washington in February. Oliver F. Fancey of the Building Materials Division of the WPB was the presiding officer. C. D. Ludlum of the office of Industry Advisory Committees outlined the purpose and functions of the meeting.

✦ ✦ ✦

THE Committee was generally of the opinion that the "A" procedure, having to do with the allotment of materials, was operating efficiently. Revised order L-185 (B.M. Div. WPB), relating to springs for trucks and passenger cars, will have little effect on industrial operations, the Committee indicated.

✦ ✦ ✦

IT was pointed out that revision of Directive 5, C.M.P. Regulation No. 3 is contemplated to permit subcontractors to receive direct allotments of materials from manufacturers of automotive products. It was stated that field and regional offices of the WPB are now authorized to approve applications for equipment up to $2,500. and applications for the construc-

tion of new manufacturing facilities where the cost does not exceed $25,000. MRO quotas, the Committee was advised, should not be exceeded, and if found inadequate, application should be made to the proper Industrial Division for relief.

✦ ✦ ✦

SOME attention was devoted to ways and means of conserving paper, by eliminating containers, reusing, packaging materials and changing shapes and sizes to secure greater economy.

✦ ✦ ✦

MEMBERS of the Committee expressed that spring makers should be added to the list of critical occupations, and considerable discussion was devoted to the manpower shortage problem, as it affected spring makers. Although the production of oil tempered springs has been slightly curtailed the situation was not regarded as critical. Mr. Fancey stated that the demand for wire products during 1944 will exceed the supply by 22 percent, indicating the desirability of further concentrating on the production of military items.

✦ ✦ ✦

MANUFACTURERS who possess stocks of steel originally acquired for military items and not now being used, by making application on Form PD-1161, may obtain authorization to divert such material to other production.

✦ ✦ ✦

WPB Forms Committee On Screw Production

THE Office of Industry Advisory Committees of the War Production Board announced the formation of the Machine, Wood, Sheet Metal Screw Industry Advisory Committee. O. F. Fancey, Building Materials Division, is the Government Presiding Officer. The members are:

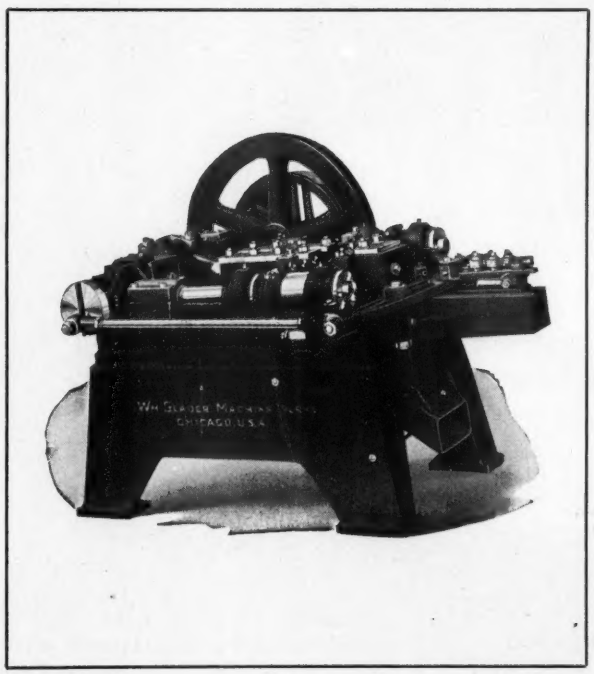
A. H. Charles, National Lock Co., Rockford, Ill.; C. O. Drayton, American Screw Co., Providence, R. I.; W. H. Hill, Scoville Manufacturing Co., Waterville, Conn.; D. S. Jennings, Central Screw Co., Chicago; F. H. Lyon, Progressive Manufacturing Co., Torrington, Conn.; C. F. Newpher, National Screw & Mfg. Co., Cleveland; Charles Parker, Charles Parker Co., Meriden, Conn.; B. J. Sackheim, Manufacturers Screw Products, Chicago; W. E. Smith, Southington Hardware Mfg. Co., Southington, Conn.; E. A. Thatcher, United Screw & Bolt Corp., Chicago; C. H. Wardwell, Continental Screw Co., New Bedford, Mass.; and E. M. Whiting, Pheoll Manufacturing Co., Chicago.

✦ ✦ ✦

THE first meeting of this committee was held March 14, 1944.

(Please turn to Page 312)

GLADER HIGH SPEED WIRE NAIL MACHINE



High tonnage output, and low maintenance costs, have resulted in Glader Machines being accepted as standard equipment in every large nail mill built in the United States in the past twenty years.

Glader Machines are operating in most of the wire producing mills throughout the world.

These machines are made in eleven different types and sizes. This enables us to cover the range of sizes of nails produced with the greatest efficiency.

For further information please address,

WM. GLADER MACHINE WORKS

210 NO. RACINE AVE.
CHICAGO, ILLINOIS

Wire Association Elects Officers for 1944-45

(Continued from Page 307)

Company, McKeesport, Pa. was again appointed the chairman and manager of the event. It is quite possible that the new tax bill may have an adverse effect on the attendance of the Smoker, as it provides a tax of 30% on the gross price of tickets. On a $5.00 ticket this would make the tax, $1.50. To this would have to be added a local Ohio tax so that each individual would be called upon to pay approximately $7.00 for a ticket this year that was $5.50 last year. This looks like a headache for the Committee to work out.

✦ ✦ ✦

Program Committee 1944 Convention

THE General Chairman for the Program Committee for the 1944 Convention will be **Mr. E. W. Gundstrom,** Asst. Plant Manager, Rome Cable Corporation, Rome. N. Y., and the Chairman of the Non-Ferrous Division of the Program Committee, **C. A. Litzler,** Chief Engineer, Industrial Oven Corporation, Cleveland, Ohio.

E. W. GUNDSTROM
Assistant Plant Manager,
Rome Cable Corporation, Rome, N. Y.
Born May 30, 1889. Received mechanical engineering education in his native land, Sweden. Upon arrival in the United States in 1911, was engaged by the General Electric Co., in Schenectady, first in designing work, later in their research laboratories. In 1917 became connected with the Rome Wire Co., Rome, N. Y., as Assistant Plant Engineer. Became Plant Engineer in 1925, severed connection with this company in 1936 to assist in the organization of the Rome Cable Corporation, Rome, N. Y. In 1937 was made Assistant Plant Manager and also in charge of all plant engineering.

✦ ✦ ✦

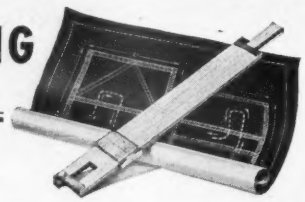
THE other members of the Program Committee at the present writing are **Mr. J. L. Schueler,** General Supt., Continental Steel Corporation, Kokomo, Indiana; **Mr. W. H. Crawford,** Resident Manager, Reliance Spring Washer Division, Eaton Manufacturing Company, Massillon, Ohio; **Mr. K. R. Beardslee,** Vice-President chg. Sales, Carboloy Company, Inc., Detroit, Mich.; **Mr. John A. Moritz,** Supt. Wire Mills, Keystone Steel & Wire Company, Peoria. Ill.; **Mr. Herbert R. Clark,** Vice President, Vascoloy Rampet Corp., Chicago, Ill.; **Major R. E. Brown,** Publisher, WIRE & WIRE PRODUCTS, 300 Main Street, Stamford, Conn. and **Mr. A. R. Zapp,** Manager Firthaloy Division, Firth-Sterling Steel Company, McKeesport, Pa. Several papers have already been arranged for and the program is now being arranged.

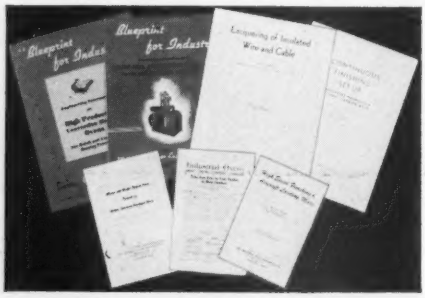
✦ ✦ ✦

Plans for 1944 Meeting

SOME time ago all members of the Wire Association received a circular letter from the secretary's office advising that difficul-

OVEN ENGINEERING NEWS



When Post-War Planning Stops And Post-War DOING Starts . . .

You'll Find This Oven Engineering Data Even More Useful Than It Is Today

In tomorrow's highly competitive market, an efficient oven materials handling system may make the difference between profit and loss. If you are planning any operation which involves oven processing, you'll want these engineering books, technical articles and reprints. All are free; just check the ones you want and send us this page.

Above, left to right:

[ ] **Blueprint for Industry, Part II**—An 18-page brochure on high-production ovens for batch and continuous heating processes.

[ ] **Blueprint for Industry, Part III** — Complete engineering information on our constant-speed, constant-tension wind-up machine for wire, cable, textile, tapes, coated fabrics and other continuous materials.

[ ] **Lacquering of Insulated Wire and Cable** — A 16-page article on cable lacquering techniques and equipment.

[ ] **Continuous Finishing Set-up Facilitates Production of Steel Landing Mats** —A magazine reprint describing production and finishing of portable aircraft landing mat sections.

[ ] **Allison and Wright Engine Parts Treated in Unique Conveyer-Equipped Oven**—Illustrated reprint.

[ ] **Three-zone Oven for Paint Finishes of Metal Furniture** — Reprint describing an interesting automatic finishing installation.

[ ] **High Speed Finishing of Aircraft Landing Mats**— This reprint gives a different treatment of landing mat job mentioned above.

CURRENT DATA

[ ] Our present series of advertisements, "Oven Engineering News", is also available in reprint form; why not send for it?

(This is No. 10 of a series. Reprints of previous advertisements will be sent free upon request.)

THE INDUSTRIAL *Oven Engineering* COMPANY
11621 Detroit Avenue **Cleveland, Ohio**

ties had arisen in connection with the hotel arrangements at Cleveland for 1944. These difficulties were discussed at the Directors' Meeting and crystalized by the receipt of a telegram from the American Society for Metals as follows:

"Can guarantee Housing Committee on which you will have representation will allocate to Wire Association members at Carter 250 Sleeping rooms singles and doubles of varying established prices. Space requests to be made by members to Housing Committee same as by members of all other co-operating societies. Due to limited numbers of suites in all Cleveland hotels, suites are to be allocated to exhibitors first, others second, all members your Association that cannot be housed Carter will have best attention Committee for Placement other hotels. Request for hotel space should be in by September 1st. Special blank or colored postcard can be used by your members which will immediately identify them. Assuring Carter assignment housing plan fair and equitable for all groups. Hope to have you with us. W. H. Eisenman."

✦ ✦ ✦

AFTER considerable discussion the Board of Directors voted to go ahead for 1944 on the basis of the telegram with the understanding that our continued association with the American Society for Metals after 1944 would depend entirely on how this new idea, which the ASM insisted upon, works out. A Committee consisting of **D. D. Buchanan,** President of the Wire Association, **R. M. Hussey,** Vice-President and **R. E. Brown,** Executive Secretary was appointed with instructions to meet with Mr. Eisenman, secretary of the American Society for Metals, as soon as possible, to iron out in advance, so far as possible, difficulties which might present themselves to the officers of the Wire Association for making satisfactory hotel reservations to be grouped in the same hotel for its members within the time limit set in the telegram. After this Committee meets with Mr. Eisenman a letter will be sent to all members of the association outlining exactly how hotel reservations must be secured for the October meeting at Cleveland.

✦ ✦ ✦

AT the present writing the Wire Association will have allotted to it by the Housing Committee of the American Society for Metals 250 sleeping rooms. This allocation, however, will expire September 1st, 1944, so if you are coming to the Convention and if you want to be allocated to the Wire Association Headquarters Hotel, i.e., the Carter, you must have your reservation in for your room not later than September 1st, 1944. Members of the Wire Association will shortly receive letters of explanation and hotel reservation blanks and it is requested that the information furnished in this letter be very carefully followed in order to secure your hotel reservation for the Convention.

✦ ✦ ✦

MRS. R. S. SPENGEL, Secretary-Treasurer of WIRE & WIRE PRODUCTS, has been appointed by the President of the Wire Association to act as the Association representative on the A.S.M. Housing Committee and further information may be obtained by communicating with her, care The Wire Association, 300 Main St., Stamford, Conn.

Get Longer Runs, Greater Tonnage with TECO Cemented Carbide Dies

WIRE and BAR DIES
EXTRUDING DIES
TUBING DIES
SIZING DIES

Also Carbide Blanks Tools, Bits, Reamers and Forming Tools

You can reduce stoppages for die changing and increase the productive running time of your machines . . . by equipping with longer-wearing TECO Cemented Carbide Dies.

TECO Cemented Carbide is harder, denser, more uniform . . . more resistant to wear and friction . . . thus stays on the job longer. TECO Cemented Carbide Dies will get the most out of your machines — in speedy, uninterrupted production; in accurate, smoothly-finished tonnage. Let our engineers know your requirements.

ARMY NAVY

TUNGSTEN ELECTRIC CORPORATION, 564 39th St., Union City, N. J.
Branch Office: 2906 Euclid Avenue, Cleveland, Ohio
Representative: Architects & Builders Bldg., Indianapolis, Ind.

TECO Pioneers in Tungsten Carbides for over a Quarter Century **CARBIDE DIES**

A Review of Recent Wire Patents

No. 2,343,570, CHECKING DEVICE FOR USE IN SCREW AND SIMILAR MACHINES, patented March 7, 1944 by Alden W. Nelson, Pawtucket, R. I., assignor to Brown and Sharpe Manufacturing Company, a corporation of Rhode Island.

The check jaws have an annular supporting groove, carrying a contractible ring friction holding device for engaging the bar stock, consisting of a number of ring segments and springs for forcing them against the stock.

✦ ✦ ✦

No. 2,344,337, CORE WINDING MACHINE, patented March 14, 1944 by Theodore L. Winestock, Lenox, Mass., assignor to General Electric Company, a corporation of New York.

Metallic strip material is wound with spacers between the windings, these spacers being held into position on the strip, by an electro-magnet, until it reaches the winding mandrel.

✦ ✦ ✦

No. 2,344,404, CORROSION PREVENTING AGENT, patented March 14, 1944 by Franz Giloy, Dessau, Germany; vested in the Alien Property Custodian.

Being non-corrosive to metals, this composition comprises solution of a small amount of an ether carboxylic acid in water containing metal-corroding materials, with the solution having a pH of at least 6.5.

Complete Descriptions and Drawings of Patents May Be Had for 25 cents; outside United States and Canada, $1.00. Address, Wire & Wire Products, 300 Main St., Stamford, Conn.

No. 2,344,586, STRAND COVERING APPARATUS, patented March 21, 1944 by William T. Barrans, Towson, Md., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York.

Included is a delivery capstan, comprising a cylindrical device having a number of longitudinal, rectangular grooves for engaging the covered strand and advancing it spirally around the capstan.

✦ ✦ ✦

No. 2,344,610 APPARATUS FOR MARKING THE SURFACE OF ELECTRIC CABLES OR SIMILAR ARTICLES, patented March 21, 1944 by Edward Spencer Hargreaves, deceased, late of Rainhill, England, by Edward Gordon Hargreaves, Saint Helens, England, and Harvey John Dunkerley, Crookham, England, executors, and Harold MacDonald Steward, Liverpool, England, assignors to British Insulated Cables Limited, Prescot, England, a British Company.

The marking roller follows a helical path about the cable without appreciable slipping between the marking surface and the cable.

✦ ✦ ✦

No. 2,344,635, ELECTRICAL CABLE, patented March 21, 1944 by Winfred K. Priestley, West Barrington, R. I., assignor to United States Rubber Company, New York, N. Y., a corporation of New Jersey.

About the wire conductors is an electrically-conductive shield, insulated therefrom, with a dielectric covering over the shield and grounding tabs extending from the shield, through the covering, and temporarily secured against the outer surface of the covering by material which provides for clean electrically-conductive surfaces to the tabs when the material is removed.

✦ ✦ ✦

No. 2,344,906, CARBONIZING METALS, patented March 21, 1944 by Henry T. Swanson, Nutley, N. J. assignor to Radio Corporation of America, a corporation of Delaware.

In applying an adherent black coating of carbon to the metal, the latter is heated in a mixed gaseous atmosphere composed essentially of one part of a hydrocarbon gas and between .75 and 2 parts of carbon dioxide, with the heating continued for ½ to 2 minutes to between 500° C. and 900° C., and then cooled out of contact with air to below its oxidizing temperature in air.

THE WATSON MACHINE COMPANY

ESTABLISHED 1845

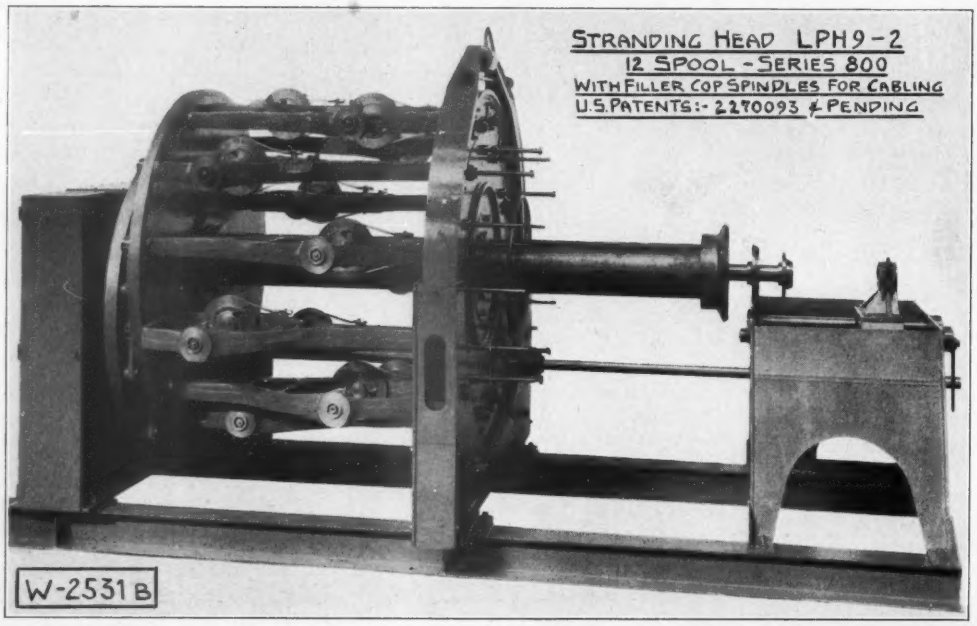
PATERSON, NEW JERSEY, U. S. A.

ELECTRICAL WIRE AND CABLE AND WIRE ROPE MACHINERY

SERIES 800 LPH

PLANETARY ARMORING - CABLING HEADS

Flat retractable pintle, anti-slap, integral tension, fully anti-friction, 1/1 ring back-turned (staggered circle) cradles. Steel, anti-friction, roller supported rotor. Automatic electric stop. Spring-set air-off brakes. Steel gearing with change-reverse gears.



Brass Mill Production, January - December, 1943

THE Brass Mill Industry of the United States reached an all-time peak production in 1943. Production was fairly well distributed with a gradual trend upward during the year. The highest quarterly production was reached in the last quarter of the year with the second quarter next. The production slump occuring during the summer months was primarily seasonal in character. The average monthly production for 1943 was approximately 468,000,000 pounds, metal weight, and for the peak fourth quarter it averaged 476,000,000. Production levels during 1944 will be determined largely by the extent of military requirements.

✦ ✦ ✦

A Review of Recent Wire Patents

(Continued From Page 314)

No. Re 22,461, WIRE SPRING AND SPRING STRUCTURE, patented July 29, 1941 by Jacob Kronheim, Cleveland Heights, Ohio assignor to John C. Lincoln, Scottsdale, Ariz., and reissued March 28, 1944.

For cushioning seats, there is provided a horizontally corrugated seating portion including at its front end a ledge upwardly and outwardly inclined with respect to the axis of the seating portion, a front supporting means rearwardly and downwardly extended from the front end of the ledge in inclined relation with respect thereto, and rear supporting means integrally extended from the rear end of this seating portion.

✦ ✦ ✦

No. 2,345,229, INSULATION FOR ELECTRICAL CONDUCTORS, patented March 28, 1944 by Boris J. Barmack, Chicago, Ill.

Over the wire conduuctor is a cellulose tape, wrapped in lapped seam relationship, this tape having a heat sealing coating which is temporarily rendered plastic by a heated saturant applied to an outer thread covering about the tape.

✦ ✦ ✦

No. 2,345,390, PROCESS FOR ENAMELING RECTANGULAR WIRE, patented March 28, 1944 by Edward J. Flynn, Schenectady, N. Y. assignor to General Electric Company, a corporation of New York.

The wire is passed through a body of viscous coating material, thereafter a larger amount of the coating material is removed from the central side portions to produce a thin liquid coating thereon and a small amount of coating material from the edge portions to produce a thick liquid coating thereon, after which the coating is baked when some of the liquid coating material on the edge portions has flown towards and merged with the liquid on the central side portions to form the uniformly thick coating.

BRASS MILL PRODUCTION STATISTICS

(Thousands of pounds — metal weight)

Month	All Products	Alloyed Products				Unalloyed Products
		Total	Plate, Sheet and Strip	Rod and Wire	Tube	
Total Year	**5,610,026**	**5,226,179**	**3,994,819**	**943,870**	**287,490**	**383,847**
January	**464,520**	**426,848**	**316,006**	**83,448**	**27,394**	**37,672**
February	**440,210**	**405,792**	**300,638**	**80,276**	**24,878**	**34,418**
March	**499,363**	**461,837**	**341,938**	**93,119**	**26,780**	**37,526**
April	**474,727**	**441,479**	**338,430**	**79,483**	**23,566**	**33,248**
May	**484,396**	**452,148**	**345,889**	**82,511**	**23,748**	**32,248**
June	**457,671**	**425,627**	**321,459**	**80,646**	**23,522**	**32,044**
July	**425,647**	**396,827**	**304,734**	**70,746**	**21,347**	**28,820**
August	**456,808**	**426,356**	**333,049**	**71,456**	**21,851**	**30,452**
September	**479,822**	**450,404**	**355,214**	**72,458**	**22,732**	**29,418**
October	**491,356**	**461,774**	**361,472**	**77,578**	**22,724**	**29,582**
November	**491,201**	**461,773**	**359,975**	**77,420**	**24,378**	**29,428**
December	**444,305**	**415,314**	**316,015**	**74,729**	**24,570**	**28,991**

DRUMS OR TRAVERSES

in all STANDARD SIZES

★

The new Garrett Division plant of the Hubbard Spool Company can supply you with drums or traverses* for all types of reels, in all standard sizes. Drum or traverse widths and diameters range from 6" to 60" . . . are furnished plain, painted, or hot dipped galvanized as you require.

Write for quotations on delivery and prices. Information on special size drums or traverses on request; send blueprint.

*Under license arrangement with the Western Electric Co., Inc.

HUBBARD SPOOL COMPANY

1624 CARROLL AVENUE | CHICAGO, ILLINOIS

Since 1912, manufacturers of wire drawing and annealing, and shipping spools and reels.

Outstanding Personalities of the Wire Industry

Reed Smith Joins Master Wire Die Corporation

REED R. SMITH formerly Assistant District Manager of the Pittsburgh Steel Company's New York office, resigned on March first to become Manager of Sales of the Master Wire Die Corporation of New York. Mr. Smith brings to his new affiliation a valuable experience on carbide wire drawing dies from the wire mill's point of view.

✦ ✦ ✦

R. T. Dunlap & E. F. Early Named Vice Presidents of Wickwire Spencer Steel

AT the meeting of the Board of Directors following the corporation's annual meeting, R. T. Dunlap and E. F. Early were elected vice presidents of the Wickwire Spencer Steel Company.

✦ ✦ ✦

MR. Dunlap was previously assistant to the president and for the past several months has been acting in the capacity of general superintendent at the company's Buffalo plant.

✦ ✦ ✦

MR. Early has long been associated with Wickwire Spencer, as general superintendent at the Morgan Plant of the company in Worcester, Mass., and is a member of the Wire Association.

✦ ✦ ✦

M. W. Batchelor Named Vice President of Bridgeport Brass Co.

AT the annual meeting of stockholders of the Bridge Brass Company, Mead W. Batchelor, works manager of the mill division was named a vice president and A. Dean Merwin, sales manager of the fabricating division was made assistant secretary.

✦ ✦ ✦

Oakite Adds to Technical Staff

IN connection with its extension program to provide still further service to the metal working industry, Oakite Products, Inc., New

GERALD A. LUX

100 ft. of ACID Protection with Molded HAVEG

The above illustration shows a 100′ long sectional HAVEG continuous strip pickling tank—just before it left the HAVEG plant to take its place in an important WAR PRODUCTS plant.

HAVEG was selected for this job because it had proved itself unaffected by the acids commonly encountered in pickling processes.

HAVEG is unaffected by Muriatic Acid, any concentration—even at boiling; is unaffected by Sulphuric Acid up to 50% concentration, and a grade is available which is highly resistant to Hydrofluoric Acid.

HAVEG has strength, toughness and durability. It is unaffected by rapid temperature changes and can be used continuously at temperatures as high as 265°F.

Important to note is the fact that HAVEG *is not a lining* or *coating* but that its chemical resistance is constant throughout its entire mass.

HAVEG Equipment includes tanks, pipe, valves, fittings, fume duct, towers.

Bulletin F-3 gives complete technical, design and application data. Send for a copy today.

HAVEG-SARAN *Tubing; Pipe & Fittings; and sheets are available from stock.* **HAVEG-SARAN** *is also described in Bulletin F-3. Send for a copy now.*

HM-43A

HAVEG CORPORATION
NEWARK, DELAWARE
FACTORY—MARSHALLTON, DELAWARE

CLEVELAND 550 Leader Building | CHICAGO 1201 Palmolive Building | DETROIT 2832 E. Grand Blvd. | LOS ANGELES 601 W. Fifth St.

Cold Rolling of Narrow Strip and Its Equipment Requirements

(Continued from Page 298)

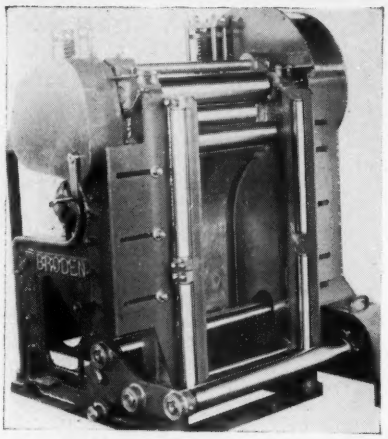


Fig. 410. Downcoilers.

✦ ✦ ✦

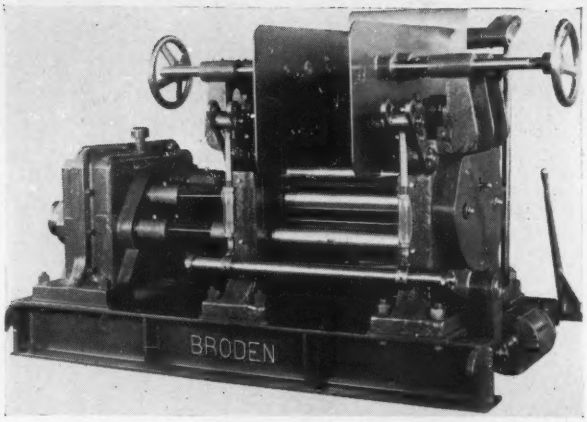


Fig. 412. Upcoilers.

✦ ✦ ✦ ✦ ✦

trol. Automatic expanding and collapsing blocks together with hydraulic or air-operated coil pushers help to make the mill operator's job easier and speed up production considerably.

✦ ✦ ✦

THE further processing of narrow strip may call for quite a variety of equipment such as levellers, slitters, edgers, filing machines, two-way straighteners, cutting-off machines, etc.

✦ ✦ ✦

WHILE the wide strip mills supply the bulk of the industry's demand it is safe to assume that the narrow strip mills producing strip of high quality and finish will always find a ready market for their product.

Outstanding Personalities

(Continued from Page 316)

York, announces the appointment of **Gerald A. Lux** to its Technical Staff. He will make his headquarters in New York.

✦ ✦ ✦

FOR two years a research associate of the American Electroplaters' Society at the National Bureau of Standards and with many years' experience as a development engineer, chemist and research director in connection with metallurgical and chemical problems involving the use of alkaline and related cleaning compounds, Mr. Lux will devote a large part of his time to Field work in an advisory capacity on special problems and developments. In addition, he will conduct research studies on metal surface preparation and finishes in Oakite's Research Laboratories in New York.

(Please turn to Page 318)

Our ADVERTISING PAGES are reliable sources of supply. ADVERTISERS are good people with whom to do business. They advertise to help you. Buy from them to assure yourself of the best that responsible concerns can make. An ADVERTISER likes to know his ads have been read, so please mention WIRE & WIRE PRODUCTS when writing him.

"Standard"
BEADING AND GROOVING MACHINE

Jumps production 200%

For precision beading, grooving and form rolling tubes through use of rolling mill principle. Grooves are developed by pressures accelerated rapidly by cam action on a form roll. Inside diameters at grooved section controlled by form roll. Hand controlled "draw-in chuck" provided for quick and simple loading.

Write for specific recommendations.

STANDARD MACHINERY CO.
PROVIDENCE 7, RHODE ISLAND

NILSON

AUTOMATIC PRESS AND FOUR SLIDE MACHINE

FOR SWAGING, STAMPING, PIERCING, BLANKING, FORMING OF COILED METAL

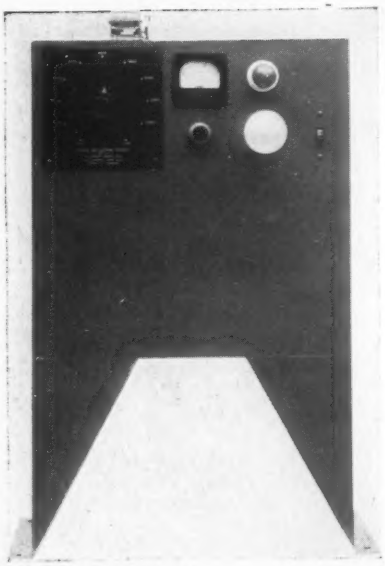
WE also build machines for forming Paper Clips, Buckles, Gate Hooks, Coat and Hat Hooks, Ceiling Hooks, Wire Ears, Cable Rings, Screw Eyes, Sash Chains, Automobile Side Chains, Flat Open Link Chains, Staples, Cotter Pins, Hose Clamps, Etc., and Wire Straighteners, Wire Reels, Frame Bending Machines and Special Presses.

For Complete Details Address —

THE A. H. NILSON MACHINE CO.

BRIDGEPORT, CONN., U. S. A.

SPARKER for SYNTHETIC EXTRUSION COMPOUNDS



THIS APPARATUS WILL LOCATE DIELECTRIC FAULTS **while the wire is being insulated. When breakdown occurs, the operator is notified by an audible alarm. A resettable counter gives the number of faults in each reel. By sorting out the defective reels in this operation, the majority of the resparking is eliminated. Continuous range of voltage at the electrode is from one thousand to sixteen thousand volts. The sparker is equipped with voltmeter reading in kilovolts, and automatic interlock with the takeup motor.**

R. L. Davis Electric Co.

Wallingford, Conn.

Outstanding Personalities of the Wire Industry

(Continued from Page 317)

Wickwire Spencer Steel Appoints Roulfs, Labor Relations Manager

MR. C. I. COLLINS, Executive Vice President of the Wickwire Spencer Steel Company, has announced the appointment of **Mr. Harry E. Roulfs** as Labor Relations Manager.

✦ ✦ ✦

MR. Roulfs will represent the office of the Executive Vice President in labor relations matters with all Company plants, maintain contacts with government agencies and other firms in the steel industry. He will act as advisor to local Wickwire Spencer plant managers.

✦ ✦ ✦

WELL known in the labor relations field, Mr. Roulfs for the past two years has been connected with the War Production Board as a labor relations consultant, specializing in war plant production and labor problems. Prior to his connection with the WPB, he was with the Maritime Commission, the Inland Steel Corporation and the Firestone Tire and Rubber Company. His headquarters will be at the Buffalo Mill of the Wickwire Spencer Steel Company.

✦ ✦ ✦

H. H. Smith Made Assistant Manager, Metallurgical Department, of American Steel and Wire Company

ANNOUNCEMENT of the appointment of H. H. Smith as assistant manager, metallurgical department was made recently by the American Steel & Wire Co., subsidiary of U. S. Steel Corp. Mr. Smith replaces the late Lawrence H. Dunham who died in January of this year. Mr. Smith became associated with the Company in 1928.

Isaac George Cochran

IT is with regret we announce the death of Isaac George Cochran on February 14th, 1944. Mr. Cochran was born in Rochester, New Hampshire, son of Miles H. and Jennie N. Cochran. He received his degree from Bates College, Lewiston, Maine where he captained his Varsity Football team his senior year and was voted the All-Maine Center.

ISAAC GEORGE COCHRAN

AFTER college he entered the employ of the American Steel & Wire Company, Worcester, Mass. serving in various capacities until he joined the Manager's staff where he served until 1933 when he came to the Laclede Steel Company, Alton, Illinois to organize their present wire mill and he served as Superintendent of the Wire Department until his death. He was an active member of the International Rotary Club of Alton. In June 1914 he married Olive M. Lasselle of Leominster, Mass.. a college classmate. They have one son, William Lasselle Cochran, M. D., U. S. Navy Medical Corps.

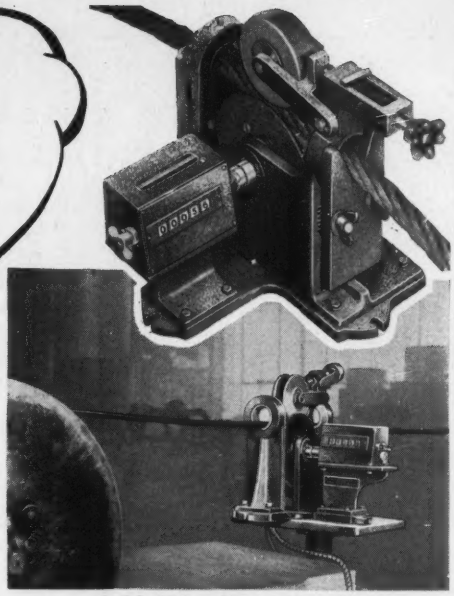
Advertising is a definite service to a concern's customers. It helps the buyer to locate and keeps him reminded of the most reliable sources of supply. Read the advertising, answer it if it concerns you, and say you saw it in WIRE & WIRE PRODUCTS.

the time is **NOW!**

to install

PRODUCTIMETERS

Now, when greater production is demanded from every machine in the wire industry! Productimeter Wire Measuring Units give accurate lineal measurement in feet . . . speeds 500 to 5000 ft. per minute . . . built for an exact purpose, they'll stand up under long, hard usage. You can depend upon them to supply the figures and facts for efficient production control.



L-20 Wire Measuring Unit
Installation: position "A". Above: position "C".

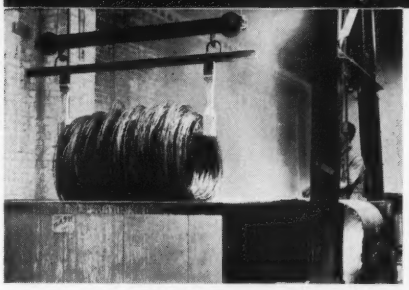
The line includes units for various wire measuring requirements . . . for different types of material . . . insulated cable, bare wire, rope, chain, braid. If you have an immediate problem write us for recommendations.

Full details in Catalog No. 3 — Copy on request!

DURANT MANUFACTURING COMPANY

1918 N. Buffum St., Milwaukee 1, Wis. **PRODUCTIMETERS** THE SPEEDOMETERS OF INDUSTRY 176 Eddy St., Providence 3, R. I.

MORRISON FLASH BAKERS



Save Time
Cut Costs
Speed Production

Fifty-three Morrison Flash Bakers now in operation in 29 plants are proving to wire manufacturers that their cost is an investment that pays dividends because of these operational features—

1—Space saving—size of a lime tank
2—Fit straight line or circle setups
3—Reduce cleaning house fog
4—Rust-free rod
5—High capacity
6—Acid brittleness recovery of about 95%
7—Rod remains on hook
8—Only a few minutes required for baking even fine wire

Descriptive Literature Sent on Request

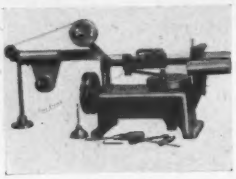
MORRISON ENGINEERED

MORRISON ENGINEERING CORPORATION
5005 EUCLID AVENUE . . CLEVELAND, OHIO
Associate Companies: MORRISON ENGINEERING OF CANADA, LTD. TORONTO, ONTARIO — CARRIER ENGINEERING CO., LTD. LONDON, ENGLAND

WIRE CUTTING & SHAPING MACHINES

For Wire From .0005" to 1/16" and Flat Stock up to 1/8"

No. 111



No. 4-E

Eisler fine wire cutting and forming machines have been in use over twenty-five years.

No. 111-H

SEND US YOUR SAMPLES

No. 4-CE

No. 111-AA

FOR INFORMATION WRITE

CHAS. EISLER

EISLER ENGINEERING CO.

747 South 13th St. (near Avon Ave.) Newark 3, N. J.

EISLER WIRE SHAPES

NEW — AND BETTER

PATENTING
TEMPERING
ANNEALING

The *Trauwood* PROCESS

OUTSTANDING ADVANTAGES

Higher and more uniform physical and fatigue properties.

No surface decarburization or scale.

Faster wire speeds . . . greater production.

Equipment fully automatic and easy to operate.

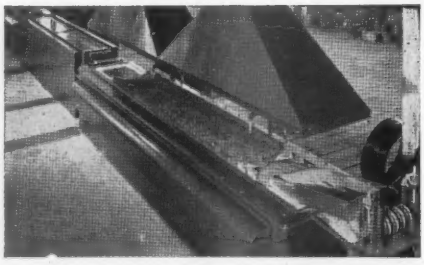
Control of heating and cooling cycles extremely accurate.

Thermal efficiency of the process very high.

Much finer grained structure possible.

High quenching temperatures rapidly attained.

Adaptable to high alloy and austenitic steel wire and strip (annealing of stainless).



Trauwood Electric Wire Tempering and Patenting Unit

The Trauwood Process, new in principle, eliminates high temperature furnaces and lead pots with their excessive maintenance costs and low thermal efficiencies. More positive temperature control is possible and quenching is done in a RISING temperature—instead of falling, as in conventional heat treating methods. The rapid rate of heating (4 to 5 times as fast as furnace heating) increases production and uniformly produces a finer grained product with higher physical and fatigue values.

Wire and rod patented by the Trauwood Process insures easier drafting and makes heavier reductions possible. In conjunction with the Trauwood patenting equipment, pickling, coating and baking can be made continuous, eliminating expensive handling and delay, materially reducing costs as compared with ordinary methods.

Complete details of the Trauwood Process will be furnished you on request. Our engineers will help you solve your continuous wire and strip patenting, tempering, and annealing problems. Write today.

THE TRAUWOOD ENGINEERING COMPANY

1740 E. 23rd STREET, CLEVELAND, OHIO, U.S.A.

Avery H. Stanton, Technical Engineering Consultant, Magnus Chemical Company, Inc.

THE **Magnus Chemical Company, Inc.**, Garwood, New Jersey, manufacturers of industrial cleaning materials, announces the appointment of **Avery H. Stanton** as Technical Engineering Consultant.

AVERY H. STANTON

MR. Stanton, a graduate of the Massachusetts Institute of Technology, was formerly with the War Production Board at Washington, D. C.

✦ ✦ ✦

HE is well known to the Pulp and and Paper Industry, having been actively associated with this industry for a number of years prior to serving in Washington.

✦ ✦ ✦

THE major portion of Mr. Stanton's activities in his new position will be devoted to Government Agencies and the Pulp and Paper Industry in regard to Industrial Cleaning and Process Control Compounds.

Dear Mr. Subscriber:

The advertising in this magazine is published for your information and benefit. Read it carefully, and when writing to an advertiser, PLEASE say that you saw it in—

WIRE & WIRE PRODUCTS

Worcester Regional Meeting
April 14, 1944

OUR thanks to **Ken Lewis, George Hartley and Rod Tatnall** for arranging a successful and interesting program for the Worcester Regional Meeting of the Wire Association on April 14th, 1944.

✦ ✦ ✦

REAR ADMIRAL WATT TYLER CLUVERIUS, our guest speaker, following an address of welcome by **Mayor Bennett,** told the assemblage of some of the things he had seen in industry's successful effort to turn from peace to war production, and in this whole-hearted, concentrated effort of America to work as a unit for the defeat of the Axis, he found much encouragement for our future. The Admiral warned against over-optimism, but had no doubt as to the ultimate outcome of the war.

✦ ✦ ✦

KENNETH B. LEWIS, as master of ceremonies, did the usual inimitable Lewis job, calling upon **D. D. Buchanan,** Manager of Operations of the Union Drawn Steel Division of the Republic Steel Corporation, the Association's new President, for some observations. Mr. Buchanan said:

"I am pleased to be here with you in Worcester, as these Worcester Regional Meetings have been outstanding, and have done much to promote the interests of the Wire Industry in New England! We think of Worcester as the original center of the Wire Industry, and it is in this city that many important contributions to the advancement of the industry have been developed.

✦ ✦ ✦

I am pleased that we are still living in a free country where we can meet together, as we are today, without the restrictions that exist in those countries with which we are at war.

✦ ✦ ✦

Wire, as we speak of it, has unlimited usages and has played a very important part in the entire war program, both in ferrous and non-ferrous products. When one realizes that not only in the non-ferrous group but from steel mills as well very great tonnages of wire are necessary for communications and other applications in the battlefields and in the air, and also that wire has played a most important part on the battlefield and in the air for handling the

(Please Turn to Page 322)

The quality **of Callite Wire has earned approval for a wide variety of military applications. For sensitive instruments, springs, bonding jumpers, wire cloth and mesh, and scratch brushes, Callite Fine Wire is meeting performance tests that prove the high craftsmanship in its drawing.**

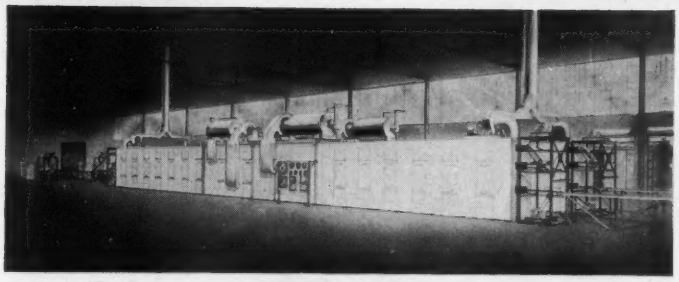
Controlled throughout production, Callite Wire is drawn to the optimum properties specified. It is held to close tolerances, accurate to size and uniform in temper. Practical help on technical matters, cooperation in meeting production schedules. Callite Tungsten Corp., 572 Thirty-ninth St., Union City, N. J. Branch Offices: Chicago, Cleveland.

Precision diameters down to .002", or smaller. Aluminum, Phosphor-Bronze, Everdur, Beryllium Copper, Stainless Steel, Silver, Silicon Bronze, Brasses, "Clad" Wires and Special Alloys. On spools, coils or cut to your exact specifications.

MORE PRODUCTION IN LESS TIME *with* **CARL-MAYER FURNACES, OVENS**

CARL-MAYER HI-SPEED ROD BAKER

The fastest rod baker built! Saves up to 50% in time and fuel. Patented Blow-Off Feature removes moisture without bumping or agitating the coils. **Patented and patents pending.**



WELDING ROD OVEN

For drying coated welding rods. Uses the "Mayer" Recirculating Gas Fired Air Heater principle and Rod Transfer Systems (patents pending).

Growing interest in our type of equipment is evidenced by Carl-Mayer installations in such plants as:—

Atlantic Wire Co.	Hollup Corp.	Pittsburgh Tool Steel Wire Co.
Atlas Steel Co.	Johnson & Nephew Ltd.	Steel Co. of Canada
Eaton Mfg. Co.	Page Steel & Wire Co.	Wickwire Spencer Steel Co.

WRITE FOR BULLETIN #241

THE CARL-MAYER CORPORATION 3030 EUCLID AVENUE CLEVELAND, OHIO

SUPER-HARD
TALIDE
DRAWING DIES
WITH TUNGSTEN CARBIDE NIBS OF EXCEPTIONAL DENSITY, STRENGTH AND HARDNESS . . . INSURE
● BETTER FINISH ● GREATER ACCURACY
● LONGER LIFE ● FEWER REJECTS
on Drawing and Extruding WIRE, RODS, BOLTS, RIVETS and TUBING
TALIDE DIES are manufactured in all standard round hole sizes from R-1 to R-18
SPECIAL SHAPE DIES
Oval, Square, Triangle, Hex etc., made to order
SHEET METAL DIES
extra large for deep drawing, cartridge cases, liners, and cans, are also made with TALIDE NIBS
FULL PARTICULARS ON REQUEST
WRITE OR WIRE TODAY!
METAL CARBIDES CORPORATION
YOUNGSTOWN, OHIO

WILLEY'S DIES LAST MUCH LONGER

SIZING, EXTRUSION and WIRE DRAWING DIES

Manufactured in all sizes, to meet your requirements, from a specially developed grade of Tungsten Carbide having freedom from porosity, exceptional abrasion resistance and the ability to take a polish equal to that of diamonds. Furnished in four classifications, (1) blank and rough cored nibs, (2) rough cored dies, (cased), (3) semi-finished, rough drilled dies, (cased), (4) finished dies, ready to use.

WRITE FOR CATALOG

WILLEY'S CARBIDE TOOL CO.
SOLE MAKERS OF WILLEY'S METAL
1342 W. Vernor Highway Detroit 1, Michigan

Worcester Regional Meeting

(Continued from Page 321)

many controls so necessary in combating the enemy in Europe and the South Pacific, the importance that is attached to the Wire Industry and to the developments made over past years becomes very clear.

✦ ✦ ✦

In analyzing experiences, one must look into the past, the present, and then into the future. We will first analyze the Wire Industry of the past, and the present, being in a period of war, and then comment briefly on the future.

✦ ✦ ✦

During the depression both the steel and non-ferrous wire mills held up their production better than any other branches of their respective industries. This was primarily due to the great variety of wire required to fill industrial and civilian needs, and it is entirely possible that after the war the industry generally will be called on to supply large tonnages of wire, both ferrous and non-ferrous, for the replacement of civilian goods. As you will realize, many of the wire products which were supplied prior to the war are off the market, and should the war last another year or two — and even at the present time there is a crying need among civilians for many of these products — there will be needed enormous replacements, to say nothing of new uses that will be found for wire as a result of war experience and developments.

✦ ✦ ✦

In supplying products for the war effort over the past couple of years, we have been thinking in terms of large tonnages due to the fact that many of the contracts let have been placed in this manner, but eventually when we work back into civilian goods, we will be supplying large tonnages distributed over a great number of customers; while these may not be in the same volume per order as we have been experiencing over the past few years, the total production in all probability, will surpass that of the past two years.

✦ ✦ ✦

Of major importance, it is going to be necessary for you men of the industry to be thinking seriously at this time, and in the future, of what you can do to keep production costs low, at the same time maintaining high standards of quality and service. This contribution is going to be essential, and even today this same thought should be carried out in your operations and drilled into your organization, bearing in mind that the training of today will be reflected in the type of job that you will do in the future.

✦ ✦ ✦

Our first job is to win the war, and every man, woman and child in this country should endeavor to give their best toward this end, so that when peace is declared we can again start to re-establish the things that the American people most love, not only in business but in our homes and our every-day living. This will require the

service of every industry in the country to do a good job.

✦ ✦ ✦

One of the greatest evils with which industry is faced today is absenteeism and the complacent attitude which many times shows itself among the workmen. Those who attended the meeting in New York will recall the program presented by the Navy, which was impressive. The Navy is spending a lot of time and money in this type of organizational work to bring forcibly to the employees' attention the evils of absenteeism, and spur their interest in doing a better job for our war effort.

✦ ✦ ✦

The point that we must all keep clearly before us is that the war is not won yet and we have a long way to go before the job is finished and we can have any feeling of security.

✦ ✦ ✦

The committee in charge of this Regional Meeting in Worcester has worked out a fine program. A few years ago when I was fortunate enough to have the time to be in your city at one of these meetings, I found it inspiring to see the enthusiasm that existed, and the spirit of good fellowship. The committee is to be congratulated on the fine program that has been worked out. It has taken a great amount of their time, but they have given it gladly for the promotion of the interests of the wire industry."

✦ ✦ ✦

THEN the meeting was turned over to **Mr. Tatnall**, who introduced the technical speaker of the evening, **J. MATTHEW DONACHIE,** Technical Director of Production of the Beryllium Corporation of Pennsylvania, who described some of the properties of Beryllium copper, the difficulties encountered in its production, the methods of processing to secure drawable rods and wire, the physicals that could be produced by proper heat treatment, pickling procedure, the use of drawing compounds and the preparation of surfaces for drawing. His talk was supported by slides showing charts of characteristics and grain structures of the alloy in its various states. Mr. Donachie's paper will be printed in full in a later issue of WIRE & WIRE PRODUCTS.

✦ ✦ ✦

FOLLOWING the talk an active discussion ensued, in which various aspects of beryllium copper were covered, from a further reference to drawing compounds to the

(Please turn to Page 324)

APEX "PIC-KLEEN" PERFORMANCE DATA

(Case #16)

Type of Wire: 46 Carbon
Speed: 1000 ft. /min.
Reduction: 87%. From .072 to .026
No. of Holes: 7

Drawn: Dry (16" block with 12" block on the finish)
Results: Upon examination, the finish die was found to be only out .0005", with no apparent wear on any of the other dies, for 2000 lbs of wire.
This wire was not limed at all.

Conclusion: APEX "PIC-KLEEN" COATING COMPOUND can do for you, in your Mill, just what it did in the above case, one of this country's largest producers of Wire Rope.
A trial will convince you.

APEX ALKALI PRODUCTS COMPANY

MAIN AND RECTOR STREETS
PHILADELPHIA 27 PENNSYLVANIA

BOSTON, MASS. PITTSBURGH, PA. ATLANTA, GEORGIA
MERIDEN, CONN. DETROIT, MICHIGAN LOS ANGELES, CALIF.

Gilron

DRAW YOUR WIRE THE MODERN WAY with GILRON COATING COMPOUNDS

A big step forward in wire drawing. Thoroughly proven in mill practice. Makes possible wire drawing speeds heretofore considered impracticable. Increases die life, prevents scratching of wire, produces better finish and eliminates use of lime in many cases.

These coating compounds are of particular value in the more difficult operations—stainless, alloy, high carbon and welding rod wire. Multiple reductions can be drawn without re-coating.

Coatings for Drawing Stainless, Alloy, Low and High Carbon and Copper Coated Wires

Let us confer with you. Write or telephone for particulars.

GILRON PRODUCTS COMPANY

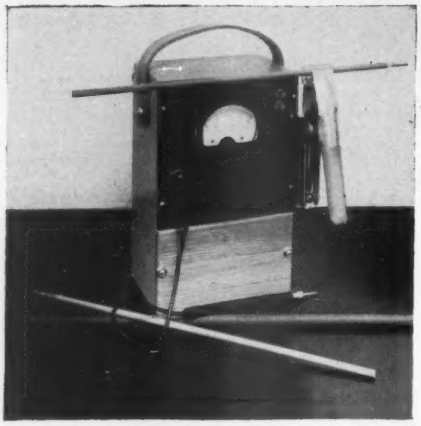
1559 EAST 40th STREET ● CLEVELAND, OHIO

Telephone HEnderson 8375

YOUR
COATED
WELDING
RODS

HOW DRY
ARE THEY?

DON'T GUESS—
KNOW—
—INSTANTLY.



MANY ROD PRODUCERS
NOW USE OUR TYPE CU-2
MOISTURE METERS—DEVELOPED
FOR THIS PURPOSE

WRITE FOR TECHNICAL DATA

HART-MOISTURE-METERS
GRAND CENTRAL TERMINAL
NEW YORK 17, N. Y.

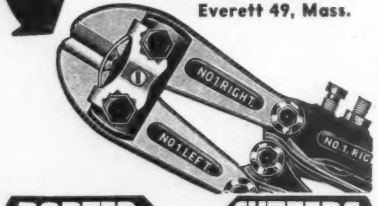
CUT HARD WIRE
The Easy Way --

including spring wire, wire fabrics, tie wire, etc., easily and quickly. Porter cutters save time and labor. Portable, hand-power — used anywhere in shop, factory, warehouse or out on a job.

There is a standard Porter tool for every cutting job. Special heads designed to fit special needs including bending, crimping, etc. Write for catalog.

**(with center cut round edge jaws)*

H. K. PORTER, INC.
Everett 49, Mass.



PORTER HKP CUTTERS

Worcester Regional Meeting

(Continued from Page 323)

possible use of beryllium as an alloy for other base metals. From this discussion it became apparent that much research is yet to be undertaken, but that its combination with steel, aluminum and other metals to produce desirable alloys is definitely indicated as a future possibility.

✦ ✦ ✦

Offers Line of Electronic Speed Control for Motors

THE **Electronic Equipment Corporation,** 917 Meriden Avenue, South Pasadena, Calif., have developed a line of electronic motor control units that are designed to operate DC motors of from one to two hundred and fifty H.P. on AC lines. These devices are said to be suited to steel mill work, including wire drawing machines. No special motors are required. Any shunt wound DC motor will operate with this RPM control from a 3 phase, 60 cycle line. Descriptive literature and prices may be had upon application.

Handy Gauge Chart

THE **Torrington Manufacturing Company, Torrington,** Conn., has prepared a handsome, durable wire gauge chart, suitable for hanging in a mill or mill office.

✦ ✦ ✦

THIS chart is printed in four colors, is 16″ x 22″ in size, and mounted on ¼″ fibre board. It gives wire sizes in Washburn and Moen, American Steel and Wire and Roebling (for steel wire) and American or Brown and Sharp (for non-ferrous sheet and wire) from size 7/0 to No. 38, the ferrous and the non-ferrous decimal equivalents being printed in different colors after the size number for quick reference.

✦ ✦ ✦

THE Company will be glad to send one of these charts to WIRE AND WIRE PRODUCTS readers upon request, as long as the supply lasts.

✦ ✦ ✦

Tungsten and Molybdenum for Lamps to Continue at Present Rate

INCANDESCENT and fluorescent lamp manufacturers in the immediate future may expect to continue to use tungsten and molybdenum at the present rate, War Production Board officials have told members of the Incandescent and Fluorescent Lamp Industry Advisory Committee. Very little change in the production of these metals is anticipated at present.

✦ ✦ ✦

MANUFACTURERS are catching up on back orders for telephone switchboard lamps, IAC members indicated. They said that WPB directives, instructing each manufacturer to set aside specific percentages of his switchboard lamp output to fill orders from the various clases of users, had proved highly efficacious.

Our advertising pages — have you studied them carefully? They contain information to guide you in the successful operation of your business. And when you write an advertiser for prices, catalogs or detailed data, won't you please say you saw his ad in WIRE AND WIRE PRODUCTS.

Faster Smut Removal After Pickling!

Removal of carbon smut after pickling is essential in the fabrication of high quality wire. That's why so many wire manufacturers are using QUICK-ACTING Oakite Composition No. 24 for this important job.

This material speedily, thoroughly removes carbon smut, yet leaves sull coat intact . . . helps cut down wear of valuable dies. Write today for complete details on how Oakite Composition No. 24 can expedite YOUR manufacture of better wire . . . there's no obligation!

OAKITE PRODUCTS, INC.
52A THAMES ST., NEW YORK 6, N. Y.

Technical Service Representatives Located in All Principal Cities of the United States and Canada

OAKITE
MATERIALS . . . METHODS . . . SERVICE
Buy Bonds for Victory

ACID AND ALKALI PROOF
LININGS AND MORTARS

ACID PROOF
CONSTRUCTION

THE CEILCOTE CO.
Consulting and Research Engineers
750 ROCKEFELLER BLDG.
CLEVELAND, OHIO

New Chemical Formulary

THE fourth edition of the Chemical Formulary, published by **The Chemical Publishing Co., Inc.,** 26 Court St., Brooklyn, N. Y., has recently been completed and is now available.

✦ ✦ ✦

THIS edition is said not to be a revision of former editions, but has been completely rewritten, and contains much material not covered by previous editions. It contains thousands of practical formulas on products of all kinds, both those manufactured for civilian consumption and those for industry.

✦ ✦ ✦

ONE chapter covers metals and their alloys; another rubber, resins, plastics and waxes, a third is devoted to paint, varnish, lacquers and other coatings, and so on. The book contains 636 pages, and sells for $6.00.

✦ ✦ ✦

New Book On Industrial Combustion

THE **Hauck Manufacturing Company,** 124 Tenth Street, Brooklyn 15, New York, have just released a handsomely bound book, called "Hauck Industrial Combustion Data."

✦ ✦ ✦

THIS book is designed to serve as a reference for anyone concerned with the selection, installation, operation or maintenance of combustion equipment, either gas or oil, as furnaces, ovens, kilns, retorts or other heat processing equipment. It is full of data that should be useful to those concerned with heat treating — tables, charts and text matters, besides illustrations and descriptions of their own line of products and services.

✦ ✦ ✦

THE book will be sent without charge to combustion engineers, operating and maintenance engineers, plant executives, builders of industrial heating equipment and metallurgists, who request the book on their company stationery.

THE FOLLOWING MISCELLANEOUS WIRE MILL EQUIPMENT IS OFFERED

FOR SALE

1—Used #3 Waterbury - Farrel Vertical Bull Block and Motor.

7—Fusion Welded Annealing Pots 29" I. D. x 84" Deep. New.

14—Rolls 8" Dia. 5" Face for cold rolling mills.

3—Bellis Transformers: 440 Volts to 17, 19, 22, 24. 60 Cycles, Secondary Amp. 5208. Air Cooled. Single Phase.

2—Double Deck Blocks, Top Block 22", for #13 Motoblocs including double deck die holder, sheave wheel and bracket apron ring, lifting and lowering die holder.

1—Brady Tube Conveyor System complete with Air Compressor and Tubes.

1—Electric Overhead Tramrail Conveying Equipment for conveying coils of wire or rods, Automatic Control, Manufactured by Louden Machinery Company.

3—New C 7602B ⅜" C.P. Self Closing Pedal Supply Valves, Manufactured by Crane Company, (Special for Hospital Use) New.

1—Exhaust Blower, #6½ Type C #476451, Rubber Lined Fan Full H.S.G. Counterclockwise, V Belt drive, Made by Buffalo Forge Company. 40" Dia. Blade, 17" Width of Blade. Intake 30" x 40" (Overall size 6' x 6' x 6') 2 sets Blades, have pulleys.

1—5" Crane Globe Valve No. 250, Flange Valve, New.

1—6" Crane Globe Valve No. 250, Screw Valve, New.

1—Used 8" Flange Type Gate Valve.

Cast Iron Fittings: 4-8" L's, 2-8" T's, 2-8" Plugs.

46 lbs 3/16" Nickel Welding Rods (Known as No. 175 Cold Drawn Grade).

11000 — Metal Spools, Curled flange, 5½" Dia. flange, 2½" Dia. overall width 2" Dia. traverse, 21/32" Dia. shaft hole.

2000—4" Metal Caps ⅞" flange.

Please send for prices and details on any items of interest to you.

THE SENECA WIRE & MFG. CO.
FOSTORIA, OHIO

Manufacturers of

MUSIC WIRE--ALL SIZES

Stainless Steel — High Carbon — Silver Nickel

Aircraft Cable & Field Telephone Wire

Wire Straightened and cut to length

All types of wire redrawn to specifications

JERSEY STEEL & WIRE CORP.

84 COIT STREET - - - IRVINGTON, N. J.

Tel. Essex 2-0800

WIRE MEASURING MACHINE

FOR LINEAR MEASURE

PROVIDES NEW STANDARD OF ACCURACY

Illustration Shows Exclusive Patented "3V" Principle

Measuring twisted, armored, bare or insulated wire without vibration or inaccuracies at any speed or varying speeds!

Write for Information and Prices

LYON-VAIL MACHINE CO.. INC.

97 Belmont Street, BROCKTON, Massachusetts

MACHINES

FOR THE WIRE INDUSTRY

BUNCHING
BRAIDING
MEASURING
TWISTING

NEBUTT CO

CLOSING
CABLING
STRANDING
COILING

Also special machines designed or built to order. Let us know your requirements.

NEW ENGLAND BUTT COMPANY

PROVIDENCE 7, R. I.

European Agency: James Day (Machinery) Ltd., Ford House, 88 Regent St.,London, W.-1, England

NIAGARA Aero HEAT EXCHANGER

Saves cooling water cost, saves equipment, saves power. Controls temperature of Wire Drawing Compounds, Industrial Liquids, Quenching Baths, Jacket Water, Lubricating Oils.

Write for Bulletins 90 & 94

NIAGARA BLOWER COMPANY

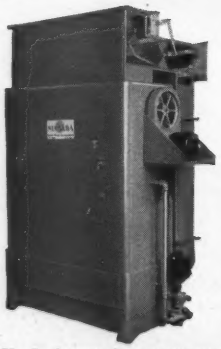
General Sales Office: 6 E. 45th St., New York 17, N. Y.

37 W. Van Buren St., Chicago 5, Ill.

Fourth & Cherry Bldg., Seattle 4, Wash.

673 Ontario St., Buffalo 7, N. Y.

SALES ENGINEERS IN PRINCIPAL CITIES



U. S. Patent Nos. 2,296,946 and 2,321,933

New Catalog On Wire Rope Slings and Fittings

John A. Roebling's Sons Company, Trenton, N. J., has just issued a 70 page catalog on wire rope, grommet and "Flatweave" slings and wire rope fittings and accessories. This book describes the classes of loads for which the ropes are intended. the sling constructions, and design characteristics. These and the following descriptions of the fittings are accompanied by engineering data in chart form, mechanical drawings and photographic illustrations of actual applications.

✦ ✦ ✦

PERSONS interested in these products may receive a copy by writing direct to the Company for it.

✦ ✦ ✦

New Steel Process May Solve Steel Shortage

R. R. SAYRES, Director of the Bureau of Mines and his assistant, R. S. Dean, told a Congressional subcommittee at a session in March that the discovery of a new processing method would make possible the making of high-grade steel in twenty-six states, whereas under present conditions 90 percent of the production is confined to five states.

✦ ✦ ✦

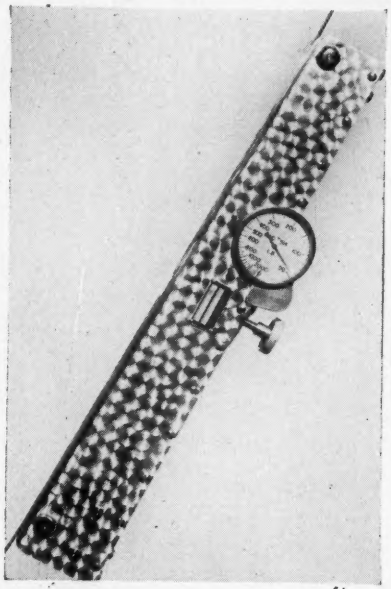
THEY have asked a House Merchant Marine subcommittee for help in obtaining funds for pilot plants to develop the process and have been promised "full support" by Chairman Boykin of Alabama. Mr. Dean said a small test plant in Boulder City, Nevada, had proved that ores from the California Shasta range could be converted locally without shipping them to Pittsburgh, as at present.

✦ ✦ ✦

THE use of the process through the Bureau's work in North Carolina has also resulted in the discovery of valuable tungsten deposits, and it was stated that both manganese and chromium could be produced commercially from low-grade ores through the process.

Cable Tension Meter

A TYPE of cable tension meter, developed during World War I, to measure the strength of steel wire used in aeronautics, and since greatly improved by technical experts of the Goodyear Aircraft Corporation, Akron, Ohio, is playing an important part in the erection and maintenance of lighter-than-air craft. Wiring is used extensively in airship building to attach the car to the bag and to manipulate fins and rudders.



The cable running lengthwise through the meter is deviated from its straight course within the meter. The force required to bend the cable is proportionate in exact ratio to the tension in the cable itself and this tension is shown on the meter's dial.

✦ ✦ ✦

THE cable is deviated or "bent" from its straight course, within the meter and the force required to so "bend" it is measured. This force is proportionate in exact ratio to the tension in the cable itself, and this tension is then shown on the meter's dial. On hard wire this deviation is influenced by the bending stiffness of the wire itself.

✦ ✦ ✦

THE length and shape of the meter permits a longer length of cable to be measured than is possible on other types of meter thus assuring greater accuracy. It has a maximum range of 3,000 pounds on wire and rope cables up to 7/16 in. diameter.

APCO-MOSSBERG STEEL REELS & SPOOLS

Standard Equipment in War as in Peace

Apco Mossberg Steel Reels are standard throughout the wire industry – and for good reason! Apco Mossberg – the original Frank Mossberg Co. – *originated* the steel reel idea and have been training workmen in their manufacture ever since. That is why Apco Mossberg Steel Reels are preferred where the pressure of wartime production schedules is heaviest.

FREE ENGINEERING SERVICE

We will gladly submit drawings, blueprints, or suggestions without obligation to you. Write for quotation today.

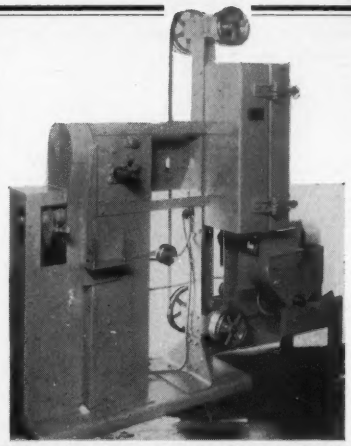
APCO MOSSBERG CO.
(The Original Frank Mossberg Co.)
21 Lamb Street . . . Attleboro, Mass.

ROOS

WIRE DRAWING DIE MACHINERY

LAPPING MACHINES
POLISHERS—GRINDERS

ROOS TOOL & MFG. CO.
17-19 GROVE ST., MONTCLAIR, N. J.



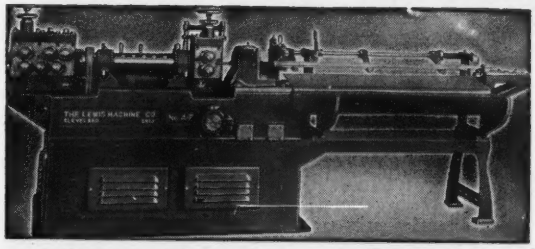
SINGLE LINE COATING OR ENAMELING MACHINE for wires as fine as .0007 inch diameter.

When writing specify coating material used.

Full line of heavier models, multiple line machines for coating wire with Enamels or Synthetics.

EST. 1885 — INC. 1915
"American" INSULATING MACHINERY COMPANY
517 West Huntingdon St.
Zone 33
PHILADELPHIA PENNSYLVANIA U.S.A.

LEWIS TRAVEL-CUT WIRE STRAIGHTENING and CUTTING Machines



Machines for 1/16" to ¾" rod
Round
Square
Flat
Hexagon
Ferrous and Non-Ferrous

Automatic
High Speed
Heavy Duty

The Sign of Dependable Service

WE CAN SUPPLY AND ENGINEER OUR TOOLS EQUIPPED WITH CARBOLOY CEMENTED CARBIDE

THE LEWIS MACHINE CO., 3445 E. 76 St., Cleveland, Ohio

FOR EXCELLENCE
IN WAR PRODUCTION
at Balloffet

ARMY E NAVY

Proudly, we are flying the Army-Navy "E" award as tangible recognition of achievement in the vital work of building war equipment. With full realization of the broad responsibilities this award involves, we pledge to keep this banner flying . . . to continue our assigned tasks, in the war effort, with the same energy and skill that merited the honor bestowed upon us.

BALLOFFET
DIES AND NOZZLE CO., Inc.
6325 Adams St., Guttenberg, N. J.
Quality Diamond Dies Since 1870

Balloffet Gets "E" Award

THE Army and Navy Production Award for outstanding achievement in producing war equipment has been conferred upon the Balloffet Dies and Nozzle Company, Inc., of Guttenberg, N. J. The presentation ceremonies will take place on May 4th in the Guttenberg School Auditorium. The Balloffet Company is under the active management and supervision of Louis Chambre, Vice President.

✦ ✦ ✦

THE firm is engaged in the production of diamond dies, a critical war material upon which every major weapon depends in some measure. The work consists of drilling and polishing minute orifices of precise shape and as small as six ten-thousandths of an inch in diameter (very much finer than a human hair) in a small diamond.

✦ ✦ ✦

UNTIL the war, all such dies used in this country were imported from abroad, mostly from France. After Pearl Harbor and at the urgent request of the U. S. Government, a few firms such as Balloffet undertook to create an American industry for this material. Machines had to be designed and built; suitable personnel had to be selected and trained. After 3 years of efforts, satisfactory dies are now being produced in this country by these firms in quantities large enough to meet America's war needs. And now comes the Army-Navy Award in recognition of Balloffet's outstanding contribution to the war effort.

VIANNEY
Famous Wire Drawing Diamond Dies

These famous Diamond Dies are now produced here at moderate prices.

All sizes are in stock or made to order to your specifications

VIANNEY WIRE DIE WORKS
250 E. 43rd St., New York.
V. J. Boulin, Manager

DIAMOND DIES
.000's to .102
Fort Wayne Wire Die Co.
2625 E. Pontiac St. Fort Wayne, Ind.

DIAMOND WIRE DRAWING DIES
INDIANA WIRE DIE COMPANY
2234 Holton Ave.
Fort Wayne, Indiana

DIAMOND DIES
CARBIDE DIES
KELLY
WIRE DIE CORPORATION
19 W. 34th St. New York

DIAMOND AND CARBIDE WIRE DRAWING DIES
RUSCH WIRE DIE CORPORATION
275 Seventh Ave., New York, N. Y.

Wire Drawing Diamond Dies
COCHAUD
WIRE DIE CORPORATION
300 W. 56th St., NEW YORK
Tel. Col. 5-1340

For the Finest DIAMOND WIRE DRAWING DIES
Look for the mark W.W.D. CO.

Particulars and Prices on Request

What do you want in diamond dies? Diamonds of best quality; workmanship that is accurate; and dies that will give the utmost in life and the highest flawless output of wire.

Every WAYNE die will meet these requirements. Use WAYNE dies to cut your costs. Least expensive in the long run.

Users of WAYNE *dies state that "they are the best value obtainable".*

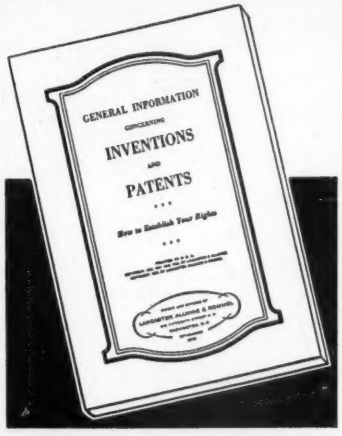
Wayne Wire Die Company 200 PENNSYLVANIA AVE., HILLSIDE, N. J. Telephone: ELizabeth 2-2456

DIAMOND DIES .0006 - .120 DIAMOND POWDER
INDUSTRIAL AJAX SUPPLIES INC.
R.R. 4, P.O. Box 66, Ft. Wayne 1, Ind., Tel. H-1311

DIAMOND WIRE DRAWING DIES
LUGINBILL WIRE DIE CO.
3410 Fairfield Ft. Wayne, Ind.

CARBIDE DIES
Wire • Tubing • Extrusion • Shell and Aircraft Extrusion Dies.
Diamond Powders In All Grades.
MICHIGAN WIRE DIE COMPANY
11152 Chalmers Ave. • Detroit 5, Michigan

Try Our Money-Saving High Quality
VICTORY CARBIDE DIES
We Accept Used Dies for Credit
WOPIS INDUSTRY LABORATORY
1634 E. 12 St. Brooklyn, N. Y. ES. 6-1815



Send for a copy - it's free.

Interesting Booklet concerning Inventions, Patents, Trade-Marks and Copyrights, together with Schedule of Government and Attorney's fees, sent free on request. Simply ask for "booklet and fee schedule."

No charges are made for preliminary advice, either in connection with patent, trade-mark or copyright cases.

Lancaster, Allwine & Rommel
Registered Patent & Trade-Mark Attorneys
438 Bowen Bldg., Washington, D. C.

Supply Situation On Brass, Steel and Alloy Wire Reviewed

THE supply situation for brass wire, steel rod and wire, and alloy wire was reviewed in detail at the meeting of the Machine, Wood and Sheet Metal Screw Industry Advisory Committee in March.

✦ ✦ ✦

WITH the exception of some strip, demands on the mills for brass wire are greater than they ever have been and copper will be tight for the duration of the war, WPB officials told the committee. Orders for steel rod and wire should be placed with mills as far ahead as possible. Alloy steel has been generally available, but carbon steel is still scarce. The industry was urged to use triple alloy steel wherever possible.

✦ ✦ ✦

AS of January 1, 1944, the machine, wood and sheet metal screw industry had 44,683 employes, of whom 34 per cent were women. The average work week in October, 1943, was 47.7 hours and average weekly earnings were $48.30. Over-all averages for all industries in October, 1943, were 45.4 hours per week and $44.90 weekly wage.

CONSULTANT AND SPECIALIST
DRAWING LUBRICANTS
Hans C. Bick, Inc.
READING, PA.

SPECIALISTS IN
DRAWING COMPOUNDS
and
SOAP POWDERS
for
WIRE DRAWING
NEIL C. POTTER
24 COMMERCE ST.
NEWARK 2, N. J.

APEX "DRAW-ALLOY" PERFORMANCE DATA
(Case #52)

Type of Wire: Copper-nickel alloy.
Speed: 2200 ft./min.
Reduction: .025 to .0063.
No. of Dies: 12
Drawn: Wet
Dies: Diamond
Results: Production figures on the finishing die jumped from a two-numbered figure to several thousand, through the use of Apex "Draw-Alloy". Quoting the wire-mill supt. verbatim: "We are obtaining unheard of results with Apex 'Draw-Alloy'."
Conclusion: A test-run of Apex "Draw-Alloy" in your mill will prove its worth on *all* nickel-alloy wires. Please write.

Apex Alkali Products Co.
MAIN & RECTOR STS.
PHILADELPHIA 27 PENNSYLVANIA

STEELSKIN
REG. U. S. PAT. OFFICE
For High or Low Carbon Wire
WIRE, TUBING, STAMPING, DEEP DRAWING SOAPS and COMPOUNDS
Established 32 years
R. H. MILLER CO., Inc. Homer, N. Y.

GEORGE D. HARTLEY

CONSULTANT & SPECIALIST

In Wire Manufacturing & Wire Forming Equipment

Development & Research
New Processes — Designing
Inventions — Patents

372 MAY ST., WORCESTER 2, MASS.

KENNETH B. LEWIS
CONSULTING ENGINEER

Wire Mill Equipment, Layout and Practice

43 Midland St., Worcester, Mass.
Phone: Worcester 5-6033

Wire Drawing Machinery

Featuring —
High Speed Upright Cone Machines.
Also —
Bull Blocks and Benches, Continuous Wire Drawing Machines, Spoolers, Pointers, String-up Machines, etc.
And —
Cold Heading Machinery.

WATERBURY FARREL FOUNDRY & MACHINE CO.
Waterbury, Conn.

SCOTT TESTERS

*Registered Trademark

60 Models for WIRE, RUBBER, TEXTILES, PAPER, ETC.

HENRY L. SCOTT CO.
55 Blackstone St. Providence, R. I.

Standard of the World

TORRINGTON SPRING COILERS

13 models in both segment and clutch types for rapid, automatic, accurate production using wire diameters .003" to .500". Torsion and other attachments available for increasing utility of Torrington Coilers.

The TORRINGTON MANUFACTURING CO.
TORRINGTON, CONNECTICUT

Issue New Directory

THE Association of Consulting Chemical Engineers, 50 East 41st Street, New York, 17, N. Y., has issued its 1944 Classified Directory. This new and enlarged edition contains ninety-six pages, listing members alphabetically, by company affiliations and geographically. Excerpts from the Code of Ethics and the By-Laws are included. Anyone desiring a copy may secure it by writing to the Association, who ask that WIRE AND WIRE PRODUCTS be mentioned in the request.

✦ ✦ ✦

New Bulletin On Milling Steel With Carbides

AN illustrated technical Bulletin No. GT-174, containing detailed information on the high speed milling of steel with cemented carbide tipped cutters has just been released by Carboloy Company, Inc., Detroit, Michigan.

✦ ✦ ✦

THE material in this manual is all based on practical field work together with observations of many jobs in almost every branch of the metal working industry, making it a useful guide for handling nearly every type of milling job using carbides. By following the principles set forth, the task of designing satisfactory carbide-tipped cutters for milling steel will be found to be greatly simplified.

✦ ✦ ✦

OF 3-by-6" dimensions and containing 72 pages, the book fits comfortably into a vest pocket. The back cover is a tear-off inquiry form, for asking additional information or requesting that a Clark field engineer call. You are invited to write for a copy.

One concern told us that they never advertised and wouldn't because they would have to call a meeting of the Board of Directors to authorize it. Our guess is that one of these days some progressive competitor will gobble them up. Buy from advertisers, and be sure of a good present and future source of supply.

SPOOLING OF WIRE

Especially interested in contacting individual firms or manufacturers to spool wire for them exclusively from coil or spools, price reasonable, work done quickly, and a good spool guaranteed, no orders too large or too small for us to handle, write or phone,

JERSEY SPECIALTY COMPANY
Singac Section, Little Falls, N. J.
Telephone, Little Falls, N. J., 4-0784

RUBBER DEPARTMENT HEAD

An outstanding opportunity for capable draft-deferred man to take complete charge of rubber insulating department of electrical wire and cable manufacturing plant. Must have thorough knowledge of C.V. tubers, rubber mixing and handling. Must be able to handle personnel effectively. Generous salary to start. Excellent future. Apply Box #371, c/o WIRE & WIRE PRODUCTS

WANTED

BAKE OVEN—Suitable for metal or wire products, adapted to accommodate 2 to 6 loaded 4 wheel trucks, indirect or direct gas heated, preferably with capacity to 600°F.

Box 372 c/o
WIRE & WIRE PRODUCTS

FOR SALE CONTINUOUS WIRE DRAWER

#1 Waterbury F. F. 10 die tandem wire drawing machine, motor drive less motor—5/16" non-ferrous rod down to #16 B. & S. Approximately 10 yrs. old.

ASHER MACHINERY CO.
126 So. 14th St., Newark 7, N. J.

Strand, Wire Rope and Cable
STEEL and COPPER

Also Signal Corps W-110-B Strand in sizes: .013 & .014 inches

The Brewer Manufacturing Co.
Muncy, Pa.

WIRE MACHINERY SPECIALISTS

3—Nilson No. 1, 3 & 4 4 Slide Wire Machines
5—Baird No. 4—Four Slide Wire Machines
7—Waterbury Step Cone Wire Drawing Machines
1—Two Spindle Bull Block Motor Driven
6—Lewis Welding Wire S. & C. Machines M. D.
2—Shuster Shaped Wire S. & C. Machines 3/8" & 7/8" Square, Hexagon & Round Stock Capacities
8—Shuster Round Wire Straightening & Cutting Machines 1/32"-3/4"

Wanted: Tack Making Machinery. All Sizes.

NATIONAL MACHINERY EXCHANGE
128-138 MOTT ST. NEW YORK, N. Y.

WATERPROOF
and
CREPE PAPER
in rolls of any size for wrapping coils and reels.
CREPE-KRAFT BARREL LINERS
THE CREPE-KRAFT COMPANY
Tel.: Market 2-0375
112 Adams St. Newark, N. J.

DI-ACRO Bender No. 1
forms round, flat or square wire to accurately duplicated shapes.
Send for Catalog.
O'Neil-Irwin Mfg. Co. 303 8th Ave. S.
Minneapolis 15, Minn.

MANUFACTURERS OF
WIRE BRAIDING — SPOOLING — TAPING
WINDING AND SPECIAL MACHINES
SINFRA WIRE COVERING MACHINES
FIDELITY MACHINE CO.
3908-18 Frankford Ave., Phila., Pa.

WIRE SPOOLING MACHINERY
and
SPECIAL MACHINERY
Address inquiries to
ROBERT J. EMORY COMPANY
Sherman Ave. & Runyon St.
Newark, N. J.

WIRE DRAWING MACHINERY
AND EQUIPMENT
Rod Frames — 16" Frames, 8" Frames — Take-Up Frames, Wire Pointers — Puller Tongs.
General and heat resisting alloy castings for wire mill use.
Circulars on Request.
E. J. SCUDDER FOUNDRY & MACHINE CO.
TRENTON, N. J.

NEP · SUMFOAM
ACID INHIBITOR · PICKLING COMPOUND
THE WM. M. PARKIN CO.
HIGHLAND BLDG. PITTSBURGH 6, PA.

PICKLING TANKS
ACID PROOF FLOORS, SEWERS, Etc.
WRITE FOR LITERATURE
NUKEM PRODUCTS CORP.
70 NIAGARA ST. BUFFALO 2, N. Y.

Designers and Builders of Gas-Fired Heat Treating Furnaces for Ferrous and Non-Ferrous Wire.
SURFACE COMBUSTION
Main Plant & General Offices - Toledo, Ohio

EYELETS
ZINC WIRE
ZINC STRIP
THE PLATT BROS. & CO.
WATERBURY, CONN.

Aluminum Imagineering Notebook

THE above is the title of an interesting treatise on aluminum that has just been published by the **Aluminum Company of America,** Pittsburgh, Pa., describing in separate chapters twelve economic advantages of the metal. Among the subjects covered are weights, corrosion resistance, electrical conductivity, workability and strength.

✦ ✦ ✦

THE booklet is non-technical in its treatment, but is designed to show what has been done in the matter of applying aluminum to various products, with the idea in mind that a study of what has been accomplished often serves as a stimulus to the discovery of new applications by some "imagineer," a person who lets his imagination soar, and then engineers his ideas down to earth. Copies may be had upon request.

✦ ✦ ✦

New Grinding Wheel Announced

THE Norton Company, Worcester, 6, Mass., has issued a new folder announcing the availability of a new grinding wheel made of #57 Alundum abrasive. This substance, a product of the Norton research laboratories, is now in production, and is said to be particularly adapted to difficult war production jobs where increased production is essential, being designed for internal, centerless and cylindrical grinding and snagging, especially on jobs where the corners of the wheels must stand up. A group of performance records are included. Copies may be had by addressing the Company.

RUESCH
Machinery For
Wire, Tube, and Brass Mills
409 Mulberry St., Newark, N. J.

WIRE ANNEALING
FURNACES and PROCESSES
COIL LOADING and STRIPPING
MACHINES — WIRE SPIDERS
LEE WILSON ENGINEERING CO., INC.
Cleveland, Ohio • ACademy 4670

ROSS ROD • WIRE BAKER
J. O. ROSS ENGINEERING CORP.
350 Madison Avenue, New York 17, N. Y.
CHICAGO DETROIT

HEADQUARTERS FOR PROCESSING MACHINERY FOR THE WELDING ROD INDUSTRY!
Place your orders now for Postwar equipment
MOSLO MACHINERY COMPANY
2443 Prospect Ave. Cleveland 15, Ohio

WIRE MILL FURNACES FUEL & ELECTRIC
For Rolling and Annealing
Ferrous and Non-Ferrous Metals
W. S. ROCKWELL Co.
50 Church St. New York 7, N. Y.

Specify SAUEREISEN
ACIDPROOF CEMENTS — COMPOUNDS
FOR
Tanks, Sewers, Stacks, Floors
Technical cements for all purposes.
Send sketches or samples
Sauereisen Cements Company · Pittsburgh 15, Penna.

Annealing Pots and Boxes
Galvanizing Kettles
Lead and Spelter Pans
Pressure Vessels
NATIONAL ANNEALING BOX CO.
Established 1895
Washington, Penna.

ACID PROOF BRICK
for
Pickling Tank Construction
Toronto Acid Brick
KEAGLER BRICK COMPANY
STEUBENVILLE, OHIO

MOSSBERG
PRESSED STEEL CORP.
ATTLEBORO, MASS.
STEEL REELS AND SPOOLS

Index To Advertisers

A

Ajax Industrial Supplies, Inc. 329
American Chemical Paint Co. 276
American Insulating Machinery Co. 327
Apco Mossberg Co. 327
Apex Alkali Products Co. 323-329

B

Balloffet Dies & Nozzle Co., Inc. 328
Bethlehem Steel Co. 274
Bick, Hans C., Inc. 329
Brewer Mfg. Co. 330
Broden Construction Co., The ..... Inside Front Cover

C

Callite Tungsten Corp. 321
Carboloy Company, Inc. 273
Carl-Mayer Corp., The 321
Ceilcote Company, The 325
Cleveland Tramrail Div. of Cleveland Engineering Co. 281
Cochaud Wire Die Corp. 328
Continental Steel Corp. 279
Crepe-Kraft Co., The 331

D

Davis, R. L., Electric Co. 318
Durant Mfg. Co. 319

E

Eisler Engineering Co. 320
Electric Furnace Company ..... Back Cover
Emory, Robert J., Co. 331

F

Fidelity Machine Co. 331
Firth-Sterling Steel Co. 290
Fort Wayne Wire Die, Inc. 328

G

Gilron Products Co., Inc. 323
Glader, Wm., Machine Works 311

H

Hart, Raymond S. 324
Hartley, Geo. D. 330
Haveg Corp. 316
Hubbard Spool Company 315
Hudson Wire Co. ..... Inside Back Cover

I

Indiana Wire Die Co. 328
Industrial Oven Eng. Co. 312

J

Jersey Specialty Co. 330
Jersey Steel & Wire Corp. 326
Jones & Laughlin Steel Corp. 280

K

Keagler Brick Co. 331
Kelly Wire Die Corp. 328
Keystone Steel & Wire Co. 310

L

Lancaster, Allwine & Rommel 329
Lewis, K. B. 330
Lewis Machine Co., The 327
Luginbill Wire Die Co. 329
Lyon-Vail Machine Co., Inc. 326

M

Magnus Chemical Co. 284
Metal Carbides Corp. 322
Michigan Wire Die Co. 329
Micro Products Co. 308
Miller, R. H., Co., Inc. 329
Morgan Construction Co. 288
Morrison Engr. Corp. 319
Moslo Machinery Co. 331
Mossberg Pressed Steel Corp. 331

N

National Annealing Box Co. 331
National Machinery Exchange 330
New England Butt Co. 326
Niagara Blower Co. 326
Nilson, A. H., Machine Co. 318
Norton Company 309
Nukem Products Co. 331

O

Oakite Products, Inc. 325
O'Neil-Irwin Mfg. Co. 331

P

Parkin, Wm. M., Co., The 331
Platt Bros. & Co., The 331
Porter, H. K., Inc. 324
Potter, Neil C. 329

R

Robertson, John, Co., Inc. 283
Rockwell, W. S., Co. 331
Roos, H. & G., Tool & Mfg. Co. 327
Ross, J. O., Engineering Corp. 331
Royle, John, & Sons 285
Ruesch, H. J., Machine Co. 331
Rusch Wire Die Corp. 328

S

Sauereisen Cements Co. 331
Scott, Henry L., Co. 330
Scudder, E. J., Foundry & Machine Co. 331
Seneca Wire & Mfg. Co. 325
Shell Oil Co. 275
Sleeper & Hartley, Inc. 294
Standard Industrial Compounds Co. 287
Standard Machinery Company 317
Stevens Metal Products Co., The 289
Surface Combustion Div. of General Properties Co., Inc. 331
Syncro Machine Co. 304-305

T

Torrington Mfg. Co., The 330
Trauwood Engineering Co. 320
Tungsten Electric Corp. 313

V

Vascoloy-Ramet Corp. 286
Vaughn Machinery Co. ..... Front Cover
Vianney Wire Die Works 328

W

Waterbury-Farrel Fdry. & Machine Co. 330
Watson Machine Co. 314
Wayne Wire Die Co. 328
Wickwire Spencer Steel Co. 277
Willey's Carbide Tool Co. 322
Wilson, Lee, Engr. Company 331
Wopis Industry Lab. 329

WHERE TO BUY

For more complete information, consult the annual Wire and Wire Products Directory, Index & Buyers' Guide.

ABRASIVES—
Norton Co., Worcester, Mass.

ACID INHIBITORS—
American Chemical Paint Co., Ambler, Pa.
Parkin, Wm. M., Co., Pittsburgh, Pa.

ACID-PROOF CONSTRUCTION—
Ceilcote Co., The, Cleveland, Ohio

AIR DRAW FURNACES—
Carl-Mayer Corp., The, Cleveland, Ohio.

ALKALINE CLEANERS—
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.

ANNEALING MACHINES—Open Flame
Syncro Machine Co., Rahway, N. J.

ANNEALING POTS AND BOXES—
National Annealing Box Co., Washington, Penna.
Scudder, E. J., Foundry & Machine Co., Trenton, N. J.

ARMORING EQUIPMENT—
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

BAKERS—Flash
Morrison Engr. Corp., Cleveland, Ohio

BAKERS—Hi-Speed
Carl-Mayer Corp., The, Cleveland, Ohio.

BAKERS—Rod and Wire
Carl-Mayer Corp., The, Cleveland, Ohio.
Morgan Construction Co., Worcester, Mass.
Morrison Engr. Corp., Cleveland, Ohio
Moslo Machinery Co., Cleveland, Ohio.
Ross, J. O., Engineering Corp., New York, N. Y.

BELTS—Wire
Wickwire Spencer Steel Co., New York, N. Y.

BENDERS—
O'Neil-Irwin Mfg. Co., Minneapolis, Minn.

BOBBINS—Braider and Wire Weaving
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.

BORON CARBIDE—
Norton Co., Worcester, Mass.

BRAKES & SHEARS—
O'Neil-Irwin Mfg. Co., Minneapolis, Minn.

BRICKS—Acid Proof
Keagler Brick Co., Steubenville, Ohio.

CABLE LACQUERING OVENS
Industrial Oven Engr. Co., Cleveland, Ohio.

CABLE—Steel and Copper
Brewer Mfg. Co., Muncy, Pa.

CARRIERS—Braider, High Speed
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt Co., Providence, R. I.

CASTINGS—Wire Mill
Scudder, E. J., Fdry. & Machine Co., Trenton, N. J.

CEMENTS—Acid Proof
Sauereisen Cement Co., Pittsburgh, Pa.

CEMENTS—Refractory
Norton Co., Worcester, Mass.

CHEMICALS—Cleaning
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Oakite Products, Inc., New York, N. Y.
Parkin, Wm. M., Co., Pittsburgh, Pa.
Standard Industrial Compounds Co., Chicago, Ill.

CLEANERS—Hand and Metal
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Oakite Products, Inc., New York, N. Y.
Standard Industrial Compounds Co., Chicago, Ill.

CLEANING & PICKLING EQUIPMENT—
Broden Construction Co., Cleveland, O.
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Haveg Corporation, Newark, Del.
Morgan Construction Co., Worcester, Mass.
Nukem Products Corp., Buffalo, N. Y.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wilson, Lee, Engr. Co., Cleveland, Ohio

CLOTH TESTERS—
Scott, Henry L., Co., Providence, R. I.

CLOTH—Wire, All Metals
Callite Tungsten Corp., Union City, N. J.
Wickwire Spencer Steel Co., New York, N. Y.

COATING COMPOUNDS—
Apex Alkali Products Co., Philadelphia, Pa.
Gilron Products Co., Cleveland, Ohio
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Inc., Homer, N. Y.
Standard Industrial Compounds Co., Chicago, Ill.

COILERS—Sheet, Strip and Wire
Broden Construction Co., Cleveland, O.
Ruesch, H. J., Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.

COLD HEADERS—
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn

COMPOUNDS—Coppering
American Chemical Paint Co., Ambler, Pa.

COMPOUNDS—Metal Finishing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.

COMPOUNDS—Rust Preventing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.

COMPOUNDS—Rust Removing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.

COMPOUNDS—Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Gilron Products Co., Cleveland, Ohio.
Miller, R. H., Co., Inc., Homer, N. Y.
Oakite Products, Inc., New York, N. Y.
Potter, Neil C., Newark, N. J.
Shell Oil Co., New York, N. Y.
Standard Industrial Compounds Co., Chicago, Ill.

CONTROLS—Heat Treating
Niagara Blower Co., Buffalo, N. Y.

COPHOLDERS—Steel
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.

CRANES—Wire Mill
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

CUTTING TOOLS—Carbide
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel Co., McKeesport, Pa.
Vascoloy-Ramet Corp., North Chicago, Ill.

CUTTING TOOLS—Wire
Porter, H. K., Inc., Everett, Mass.

DIAMONDS—Industrial
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N. J.
Callite Tungsten Corp., Union City, N. J.
Michigan Wire Die Co., Detroit, Mich.
Rusch Wire Die Corp., New York, N. Y.
Vianney Wire Die Wks., New York, N. Y.

DIAMOND POWDERS—
Michigan Wire Die Co., Detroit, Mich.
Rusch Wire Die Corp., New York, N. Y.

DIAMOND TOOLS—
Rusch Wire Die Corp., New York, N. Y.

DIE MAKING MACHINERY — For Forming Special Shapes
O'Neil-Irwin Mfg. Co., Minneapolis, Minn.

DIES—Diamond
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N. J.
Cochaud Wire Die Corp., New York, N. Y.
Fort Wayne Wire Die, Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Luginbill Wire Die Co., Fort Wayne, Ind.
Michigan Wire Die Co., Detroit, Mich.
Rusch Wire Die Corp., New York, N. Y.
Vianney Wire Die Works, New York, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIES—Lead Extrusion
Robertson, John, Co., Brooklyn, N. Y.

DIES—Repairs & Re-Cutting
Ajax Industrial Supplies Co., Fort Wayne, Ind.
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N. J.
Carboloy Co., Inc., Detroit, Mich.
Cochaud Wire Die Corp., New York, N. Y.
Firth-Sterling Steel Co., McKeesport, Pa.
Fort Wayne Wire Die, Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Luginbill Wire Die Co., Fort Wayne, Ind.
Rusch Wire Die Corp., New York, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Works, New York, N. Y.
Wayne Wire Die Co., Hillside, N. J.
Willey's Carbide Tool Co., Detroit, Mich.

DIES—Rod and Tube Drawing
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N. J.
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel Co., McKeesport, Pa.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, Ohio.
Michigan Wire Die Co., Detroit, Mich.
Rusch Wire Die Corp., New York, N. Y.
Tungsten Electric Corp., Union City, N. J.
Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Works, New York, N. Y.
Willey's Carbide Tool Co., Detroit, Mich.

DIES—Tantalum Carbide
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N. J.
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel Co., McKeesport, Pa.
Kelly Wire Die Corp., New York, N. Y.
Rusch Wire Die Corp., New York, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Works, New York, N. Y.
Willey's Carbide Tool Co., Detroit, Mich.

DIES—Tungsten Carbide
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N. J.
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel Co., McKeesport, Pa.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, Ohio.
Michigan Wire Die Co., Detroit, Mich.
Rusch Wire Die Corp., New York, N. Y.
Tungsten Electric Corp., Union City, N. J.
Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Works, New York, N. Y.
Willey's Carbide Tool Co., Detroit, Mich.
Wopis Industry Laboratory, Brooklyn, N. Y.

DIRECT ELECTRIC RESISTANCE HEATING—
Trauwood Engr. Company, Cleveland, Ohio

DRAW BENCHES—
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Foundry & Machine Co., Trenton, N. J.
Standard Machinery Co., Providence, R. I.
Vaughn Machinery Co., Cuyahoga Falls, O.

DRUMS—Flange Steel
Stevens Metal Products Co., Niles, O.

DRUMS—Vulcanizing
Mossberg Pressed Steel Corp., Attleboro, Mass.

DRYING AND PRE-HEATING ROOMS—
Industrial Oven Engr. Co., Cleveland, O.

DRYING EQUIPMENT—
Niagara Blower Co., Buffalo, N. Y.
Ross, J. O., Engr. Corp., New York, N. Y.

ENGINEERS—Consulting Wire Mill
Hartley, George D., Worcester, Mass.
Lewis, Kenneth B., Worcester, Mass.

EQUIPMENT—Humidifying—
Niagara Blower Co., Buffalo, N. Y.

EQUIPMENT—Insulation Testing
Davis, R. L., Electric Co., Wallingford, Conn.

EYELETS—Brass or Zinc
Platt Bros. & Co., The, Waterbury, Conn.

FENCES AND FENCING—Wire
Wickwire Spencer Steel Co., New York, N. Y.

FLASH BAKER—
Morrison Engr. Corp., Cleveland, Ohio

FLUXES—Soldering
American Chemical Paint Co., Ambler, Pa.

FOAM PRODUCING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Parkin, Wm. M., Co., Pittsburgh, Pa.

FRICTION PAY-OFF STANDS—
Industrial Oven Engr. Co., Cleveland, O.

FURNACES—Annealing
Carl-Mayer Corp., The, Cleveland, Ohio.
Electric Furnace Co., Salem, O.
Morrison Engr. Corp., Cleveland, Ohio
Rockwell, W. S., Co., New York, N. Y.
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio.
Trauwood Engr. Company, Cleveland, Ohio
Wilson, Lee, Engr. Co., Cleveland, Ohio

WHERE TO BUY, Continued

FURNACES—Automatic
Carl-Mayer Corp., The, Cleveland, Ohio.
Electric Furnace Co., Salem, O.
Morrison Engr. Corp., Cleveland, Ohio
Rockwell, W. S., Co., New York, N. Y.
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Brazing
Electric Furnace Co., Salem, O.
Firth-Sterling Steel Co., McKeesport, Pa.

FURNACES—Bright Annealing
Electric Furnace Co., Salem, O.
Rockwell, W. S., Co., New York, N. Y.
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Electric
Electric Furnace Co., Salem, Ohio
Rockwell, W. S., Co., New York, N. Y.
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio
Trauwood Engr. Co., Cleveland, Ohio

FURNACES—Hardening & Tempering
Carl-Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio
Morrison Engr. Corp., Cleveland, Ohio
Rockwell, W. S., Co., New York, N. Y.
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio
Trauwood Engr. Co., Cleveland, Ohio

FURNACES—Lead Melting
Electric Furnace Co., Salem, Ohio
Robertson, John, Co., Brooklyn, N. Y.
Rockwell, W. S., Co., New York, N. Y.
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio

FURNACES—Non-Oxidizing
Carl-Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio
Morrison Engr. Corp., Cleveland, Ohio
Rockwell, W. S., Co., New York, N. Y.
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio

FURNACES—Normalizing
Carl-Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio
Morrison Engr. Corp., Cleveland, Ohio
Rockwell, W. S., Co., New York, N. Y.
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio.

FURNACES—Salt Bath
Electric Furnace Co., Salem, Ohio
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio.

FURNACES—Wire, Strip & Sheet
Carl-Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio
Morrison Engr. Corp., Cleveland, Ohio
Rockwell, W. S., Co., New York, N. Y.
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio

GALVANIZING EQUIPMENT—
Wilson, Lee, Engr. Co., Cleveland, Ohio

GALVANIZING KETTLES—
National Annealing Box Co., Washington, Penna.

GRINDERS—Roll
Norton Co., Worcester, Mass.

HI-SPEED BAKERS—
Carl-Mayer Corp., The, Cleveland, Ohio

HOISTS—Electric Travelling
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

INHIBITORS—
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Parkin, Wm. M., Co., Pittsburgh, Pa.

INSULATION LACQUERING SYSTEMS—Continuous
Industrial Oven Engr. Co., Cleveland, O.

KETTLES—Galvanizing, Annealing, Tinning, etc.
National Annealing Box Co., Washington, Penna.

LATHES—Die Reaming
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel Co., McKeesport, Pa.
Morgan Construction Co., Worcester, Mass.
Roos, H. & G., Tool & Mfg. Co., Montclair, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry & Machine Co., Waterbury, Conn.

LININGS—Acid and Alkali Proof
Ceilcote Co., The, Cleveland, Ohio

LUBRICANTS—For Metal Cutting, Stamping and Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Inc., Homer, N. Y.
Standard Industrial Compounds Co., Chicago, Ill.

LUBRICANTS—Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Bick, Hans C., Inc., Reading, Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Inc., Homer, N. Y.
Oakite Products, Inc., New York, N. Y.
Potter, Neil C., Newark, N. J.
Standard Industrial Compounds Co., Chicago, Ill.

MACHINERY—Armoring (Cable, Wire Hose)
American Insulating Mach'y. Co., Phila., Pa.
Fidelity Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Robertson, John, Co., Brooklyn, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Braiding
Fidelity Machine Co., Philadelphia, Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Brazing
Syncro Machine Co., Rahway, N. J.

MACHINERY—Bunching
American Insulating Mach'y. Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Bundling, Scrap
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.

MACHINERY—Cable, Electric
American Insulating Mach'y. Co., Phila., Pa.
Fidelity Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Chain Making
Nilson, A. H., Machine Co., The, Bridgeport, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Closing
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Coil Winding
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Coilers
Broden Construction Co., Cleveland, Ohio
Morgan Construction Co., Worcester, Mass.
New England Butt Co., Providence, R. I.
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Copper Wire Drawing and Rolling
American Insulating Machy. Co., Philadelphia, Pa.
Ruesch, H. J., Machine Co., Newark, N. J.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Covering Wire
American Insulating Machy. Co., Philadelphia, Pa.
Fidelity Machine Co., Philadelphia, Pa.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Cutting
Broden Construction Co., Cleveland, Ohio
Eisler Engineering Co., Newark, N. J.
Lewis Machine Co., The, Cleveland, Ohio
Moslo Machinery Inc., Cleveland, Ohio.
National Machinery Exchange (Used), New York, N. Y.
Nilson, A. H., Machine Co., The, Bridgeport, Conn.
Porter, H. K., Inc., Everett, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Die Making
Firth-Sterling Steel Co., McKeesport, Pa.
Roos, H. & G., Tool & Mfg. Co., Montclair, N. J.

MACHINERY — Die Making for Forming Special Shapes
O'Neil-Irwin Mfg. Co., Minneapolis, Minn.

MACHINERY—Draw Benches
Broden Construction Co., Cleveland, Ohio.
Morgan Construction Co., Worcester, Mass.
Ruesch, H. J., Machine Co., Newark, N. J.
Standard Machinery Co., Providence, R. I.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Edging
Broden Construction Co., Cleveland, Ohio.
Standard Machinery Co., Providence, R. I.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Enameling
American Insulating Mach'y. Co., Phila., Pa.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Extruding
Robertson, John, Co., Brooklyn, N. Y.
Royle, John, & Sons, Paterson, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Flat Wire
Broden Construction Co., Cleveland, Ohio
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Forming
Eisler Engineering Co., Newark, N. J.
National Machinery Exchange (Used), New York, N. Y.
Nilson, A. H., Machine Co., The, Bridgeport, Conn.
O'Neil-Irwin Mfg. Co., Minneapolis, Minn.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Providence, R. I.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Galvanizing
Wilson, Lee, Engr. Co., Cleveland, Ohio

MACHINERY—Galvanizing Wire
Broden Construction Co., Cleveland, O.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wilson, Lee, Engr. Co., Cleveland, Ohio

MACHINERY—Gang Winders
Fidelity Machine Co., Philadelphia, Pa.
Robinson Mfg. Co., Muncy, Pa.
Ruesch, H. J., Machine Co., Newark, N. J.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Grinding
Norton Co., Worcester, Mass.

MACHINERY—Insulating
American Insulating Mach'y Co., Phila., Pa.
Fidelity Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Royle, John, & Sons, Paterson, N. J.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Knitting
Fidelity Machine Co., Philadelphia, Pa.

MACHINERY—Lead Encasing Presses, etc.
Robertson, John, Co., Brooklyn, N. Y.

MACHINERY—Lead Stripping
Robertson, John, Co., Brooklyn, N. Y.
Watson Machine Co., Paterson, N. J.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Magnet Wire
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Material Handling
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio.

WHERE TO BUY, Continued

MACHINERY — Measuring Wire & Cable
Davis, R. L., Electric Co., Wallingford, Conn.
Durant Mfg. Co., Milwaukee, Wis.
Lyon-Vail Machine Co., Brockton, Mass.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail and Tack
Broden Construction Co., Cleveland, Ohio.
Glader, Wm., Machine Works, Chicago, Ill.
National Machinery Exchange (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Panning
American Insulating Mach'y Co., Phila., Pa.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Pointing
Broden Construction Co., Cleveland, Ohio
Morgan Construction Co., Worcester, Mass.
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Quill Winding
Fidelity Machine Co., Philadelphia, Pa.

MACHINERY—Rod Mill
Broden Construction Co., Cleveland, Ohio
Morgan Construction Co.. Worcester, Mass.
Ruesch, H. J., Machine Co., Newark, N. J.

MACHINERY—Rolling Mill
Broden Construction Co., Cleveland, Ohio
Morgan Construction Co., Worcester, Mass.
National Machinery Exchange (Used), New York, N. Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Standard Machinery Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Rubber for Insulating Wire
Royle, John, & Sons, Paterson, N. J.

MACHINERY—Rubber Strip Covering
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Rubber Tubing and Straining
New England Butt Co., Providence, R. I.
Royle, John, & Sons, Paterson, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Screw Wire
National Machinery Exchange (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Special
American Insulating Mach'y Co., Phila., Pa.
Broden Construction Co., Cleveland, Ohio
Emory, Robert J., Co., Newark, N. J.
New England Butt Co., Providence, R. I.
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Providence, R. I. (Special Designs)
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Spooling
American Insulating Mach'y Co., Phila., Pa.
Emory, Robert J., Co., Newark, N. J.
Fidelity Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Spring Making
National Machinery Exchange (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Staple
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening
Broden Construction Co., Cleveland, Ohio
Lewis Machine Co., The, Cleveland, Ohio
Moslo Machinery Co., Cleveland, Ohio
National Machinery Exchange (Used), New York, N. Y.
Nilson, A. H., Machine Co., The, Bridgeport, Conn.
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Stranding
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Strip Steel
Broden Construction Co., Cleveland, Ohio
Ruesch, H. J., Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Swaging
National Machinery Exchange (Used), New York, N. Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Taping
American Insulating Mach'y Co., Phila., Pa.
Fidelity Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Testing
Scott, Henry L., Co., Providence, R. I.

MACHINERY—Testing Size of Wire
Davis, R. L., Electric Co., Wallingford, Conn.

MACHINERY—Testing Spring
Standard Machinery Co., Providence, R. I.

MACHINERY—Tinsel Rolling Mills
American Insulating Mach'y Co., Phila., Pa.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Trolley Wire
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill
Ruesch, H. J., Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Welding Wire
Micro Products Co., Chicago, Ill.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Winding
American Insulating Mach'y Co., Phila., Pa
Fidelity Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wind-up (Constant Tension, Variable Speed)
Industrial Oven Engr. Co., Cleveland, O.

MACHINERY—Wire Bending
O'Neil-Irwin Mfg. Co., Minneapolis, Minn.

MACHINERY—Wire Drawing
American Insulating Mach'y Co., Phila., Pa.
Broden Construction Co., Cleveland, Ohio
Morgan Construction Co., Worcester, Mass.
National Machinery Exchange (Used), New York, N. Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Wire Measuring
Durant Mfg. Co., Milwaukee, Wis.
Lyon-Vail Machine Co., Inc., Brockton, Mass.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Rope
New England Butt Co.. Providence. R. I.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Tinning
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence. R. I.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Wood Screw
National Machinery Exchange (Used), New York, N. Y.

MATERIAL HANDLING EQUIPMENT
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

MILLS—Tandem Rolling and Edging
Standard Machinery Co., Providence, R. I.
Torrington Mfg. Co., Torrington, Conn.

MOISTURE METERS—
Raymond S. Hart, Jersey City, N. J.

NICKEL SILVER AND PHOSPHOR BRONZE—Rod, Wire and Strip
Hudson Wire Co., Ossining, N. Y.

OILS—Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Miller, R. H., Co., Inc., Homer, N. Y.
Shell Oil Co., New York, N. Y.
Standard Industrial Compounds Co., Chicago, Ill.

OVENS—Cable Lacquering
Industrial Oven Engr. Co., Cleveland, Ohio

OVENS—Dehydrogenizing
Industrial Oven Engr. Co., Cleveland, O.

OVENS—Industrial
Carl-Mayer Corp., The, Cleveland, Ohio
Industrial Oven Engr. Co., Cleveland, Ohio
Morrison Engr. Corp., Cleveland, Ohio
Ross, J. O., Engineering Corp., New York, N. Y.

OVENS—Welding Rod Coating
Industrial Oven Engr. Co., Cleveland, O.

PAINTS—Heat Resisting
American Chemical Paint Co., Ambler, Pa.

PAINTS—Marine
American Chemical Paint Co., Ambler, Pa.

PAINTS—Structural Steel
American Chemical Paint Co., Ambler, Pa.

PANS—Lead and Spelter
National Annealing Box Co., Washington, Penna.

PANS—Vulcanizing
Mossberg Pressed Steel Corp., Attleboro, Mass.

PAPER—Creped Wrapping
Crepe-Kraft Co., Newark, N. J.

PAPER TESTERS—
Scott, Henry L., Co., Providence, R. I.

PATENT ATTORNEYS—
Lancaster, Allwine and Rommel, Washington, D. C.

PICKLING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Parkin, Wm. M., Co., Pittsburgh, Pa.

PICKLING TANK LININGS—
Ceilcote Co., The, Cleveland, O.
Keagler Brick Co., Steubenville, Ohio.
Sauereisen Cement Co., Pittsburgh, Pa.

PIPES AND FITTINGS—Acid Resistant
Haveg Corp., Newark, Del.

PLASTIC TESTERS—
Scott, Henry L., Co., Providence, R. I.

POTS—Lacquer
Industrial Oven Engr. Co., Cleveland, O.

POTS—Lead Melting
Robertson, John, Co., Brooklyn, N. Y.

POWDER—Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.

PRESSES—Hydraulic and Mechanical
Robertson, John, Co., Brooklyn, N. Y.
Standard Machinery Co., Providence, R. I. (Mechanical Only)

WHERE TO BUY, Continued

PRESSES—Lead
Robertson, John, Co., Brooklyn, N. Y.

PRESSURE VESSELS—
National Annealing Box Co., Washington, Penna.

PULLERS—Wire
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.

PUMPS—Hydraulic
Robertson, John, Co., Brooklyn, N. Y.

QUENCHING BATH CONTROLS—
Niagara Blower Co., Buffalo, N. Y.

REEL AND TENSION STAND—
Fidelity Machine Co., Philadelphia, Pa.
Moslo Machinery Co., Cleveland, Ohio
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.

REEL CRUTCHES—
Watson Machine Co., Paterson, N. J.

REELS—Annealing and Stranding
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Moslo Machinery Co., Cleveland, Ohio
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

REELS—Steel
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

REELS AND SPOOLS—Shipping and Shop
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

REELS—Takeoff
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Moslo Machinery Co., Cleveland, Ohio
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

REELS—Vulcanizing and Impregnating
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

REELS—Wire Drawing
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Moslo Machinery Co., Cleveland, Ohio
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

REFRACTORIES—High Temperature
Norton Co., Worcester, Mass.

ROD BAKERS—
Carl-Mayer Corp., The, Cleveland, Ohio
Morrison Engr. Corp., Cleveland, Ohio
Moslo Machinery Co., Cleveland, Ohio
Ross, J. O., Engineering Corp., New York, N. Y.

RODS—Wire—Non-Ferrous
Hudson Wire Co., Ossining, N. Y.
Platt Bros. & Co., The, Waterbury, Conn.

RODS—Wire—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Indiana.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.

ROLL STRAIGHTENERS—
Moslo Machinery Co., Cleveland, Ohio

ROPE—Wire
Bethlehem Steel Co., Bethlehem, Pa.
Brewer Mfg. Co., Muncy, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Wickwire Spencer Steel Co., New York, N. Y.

RUBBER AND RUBBER COMPRESSION TESTERS—
Scott, Henry L., Co., Providence, R. I.

RUST PROOF COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.

RUST REMOVING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.

SATURATION SYSTEMS—
Industrial Oven Engr. Co., Cleveland, O.

SHEARS—
O'Neil-Irwin Mfg. Co., Minneapolis, Minn.

SHEET—Steel
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.

SOAPS—Industrial and Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Inc., Homer, N. Y.
Potter, Neil C., Newark, N. J.
Standard Industrial Compounds Co., Chicago, Ill.

SOLVENT RESIN SYSTEMS—Experimental
Industrial Oven Engr. Co., Cleveland, O.

SPOOLS—Annealing and Wire Drawing
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

SPOOLS—Shipping and Shop
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

SPOOLS—Steel
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

SPRINGS—Steel
Wickwire Spencer Steel Co., New York, N. Y.

STAMPINGS—Steel
Hubbard Spool Co., Chicago, Ill
Mossberg Pressed Steel Corp., Attleboro, Mass.

STRAND—Steel and Copper
Brewer Mfg. Co., Muncy, Pa.

STRIP—Brass and Non-Ferrous
Hudson Wire Co., Ossining, N. Y.

STRIP—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Firth-Sterling Steel Co., McKeesport, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.

STRIP METAL TESTERS—
Scott, Henry L., Co., Providence, R. I.

SWIFTS—Take-off
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.

TANK LININGS—Brick
Ceilcote Co., The, Cleveland, O.
Keagler Brick Co., Steubenville, Ohio.
Nukem Products Corp., Buffalo, N. Y.

TANKS—Compound
Watson Machine Co., Paterson, N. J.

TANKS—Pickling
Haveg Corp., Newark, Del.
Nukem Products Corp., Buffalo, N. Y.
Sauereisen Cements Co., Pittsburgh, Pa.

TANKS—Steel
Mossberg Pressed Steel Corp., Attleboro, Mass.

TEMPERATURE CONTROLS—
Niagara Blower Co., Buffalo, N. Y.

TENSILE TESTERS—
Scott, Henry L., Co., Providence, R. I.

TESTING INSTRUMENTS—
Scott, Henry L., Co., Providence, R. I.

TOOLS—Wire Cutting
Porter, H. K., Inc., Everett, Mass.

TRAMRAIL SYSTEMS—
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

TREADS—Safety
Norton Co., Worcester, Mass.

TRUCKS—
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

TUBE BENDERS AND FORMERS—
Ruesch, H. J., Machine Co., Newark, N. J.

TURKS HEADS—Friction and Power Driven
Standard Machinery Co., Providence, R. I.

VALVES AND FITTINGS—Acid Resistant
Haveg Corp., Newark, Del.

VULCANIZERS—
Watson Machine Co., Paterson, N. J.

VULCANIZING PANS—
American Insulating Mach'y Co., Phila., Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.

WELDERS—Spot and Butt
Micro Products Co., Chicago, Ill.
Moslo Machinery Co., Cleveland, Ohio

WIND-UP AND UNWIND SYSTEMS—Continuous
Industrial Oven Engr. Co., Cleveland, O.

WIRE—Cold Heading
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Indiana.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.

WIRE—Electric
Hudson Wire Co., Ossining, N. Y.

WIRE—Enameled for Coils
Winsted Div. of Hudson Wire Co., Winsted, Conn.

WIRE—Manufacturers
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Firth-Sterling Steel Co., McKeesport, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Wickwire Spencer Steel Co., New York, N. Y.

WIRE—Music
Jersey Steel & Wire Corp., Irvington, N. J.

WIRE—Nickel Silver and Phosphor Bronze
Callite Tungsten Corp., Union City, N. J.
Hudson Wire Co., Ossining, N. Y.

WIRE—Non-Ferrous to Specification for Special Purposes
Callite Tungsten Corp., Union City, N. J.
Hudson Wire Co., Ossining, N. Y.
Winsted Div. of Hudson Wire Co., Winsted, Conn.

WIRE—Spring
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Firth-Sterling Steel Co., McKeesport, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Wickwire Spencer Steel Co., New York, N. Y.

WIRE—Stainless Steel
Callite Tungsten Corp., Union City, N. J.
Firth-Sterling Steel Co., McKeesport, Pa.
Jersey Steel & Wire Corp., Irvington 11, N. J.

WIRE—Steel—Also Coppered Steel—Also Galvanized Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Wickwire Spencer Steel Co., New York, N. Y.

WIRE AND STRIP—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

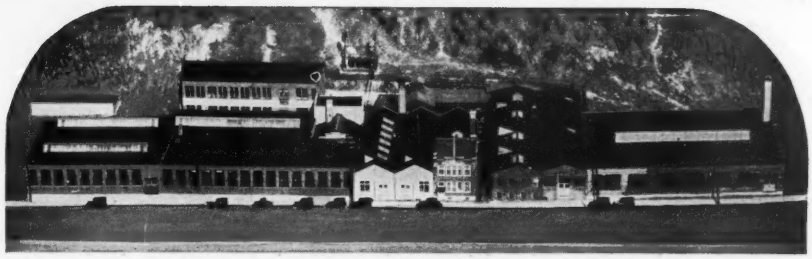
WIRE TESTERS—
Scott, Henry L., Co., Providence, R. I.

WIRE, WEAVING—Non-Ferrous
Hudson Wire Co., Ossining, N. Y.

WRAPPING PAPER—Creped
Crepe-Kraft Co., Newark, N. J.

YARN TESTERS—
Scott, Henry L., Co., Providence, R. I.

HUDCO



HUDSON WIRE CO. PLANT AT OSSINING, N. Y.

This plant is one of the most up-to-date and completely equipped plants in the world for the production of "HUDCO" fine wires in all metals.

ESTABLISHED IN 1902

HUDCO

WIRES FOR METAL SPRAYING

Pure Lead, Lead Alloy, Pure Zinc, Zinc Alloy, Copper, Tin, High Brass, Low Brass, Solder Wire, High Conductivity, Electric Wire. Cadmium, Nickel Silver, Aluminum, Monel Metal, Phosphor Bronze, Pure Nickel, Commercial Bronze, Brush Wires, Crimp and Straight, Brass, Steel, Nickel Silver, Copper and Phosphor Bronze.

HUDCO

FINE BARE WIRES

High Brass, Low Brass, Zinc 99.99+ and High Tensile Zinc, Commercial Bronze, Phosphor Bronze, Pure Tin, Lead, Antimonial Lead, Tinsel Lahns, Silver Plated Copper, False Gold and Copper. Cadmium, Nickel Silver, Silver Plated Copper, False Gold and Special Brass and Bronze Alloys to Specification, Metallic Fibre for Packing Purposes, Copper, Bronze, Zinc, Lead and Aluminum.

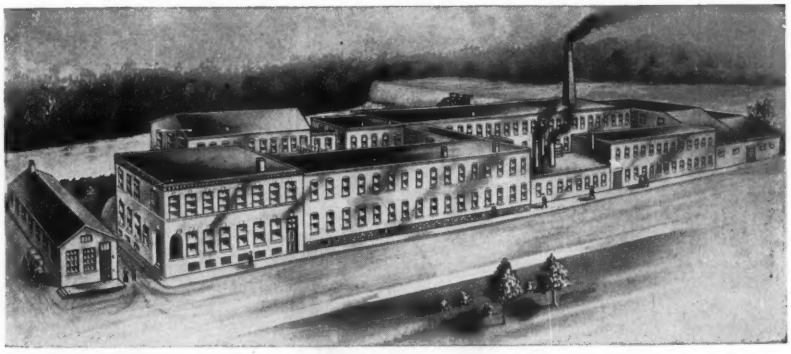
"HUDCO" specially processed Copper Wire for enamelling purposes is drawn from Selected Copper, insuring the maximum conductivity. This is but one example of the use of the most advanced and approved materials and methods in our processing.

BETTER WIRE AT LOWER COST

Send Us Your Specifications and Let Us Quote Prices

HUDSON WIRE COMPANY • OSSINING, N. Y.

WINCO



Winsted Division of HUDSON WIRE CO. at Winsted, Conn., modern and completely equipped enamelled wire plant for LEAKPROOF ENAMELLED WIRE and all standard and special coverings.

"WINCO" enamelled wire is drawn from special selected copper, assuring perfect enamelling. All wire tested before shipment.

"WINCO" enamelled wire is available in all standard and special coverings made to meet exacting requirements.

Samples of LEAKPROOF and other enamelled wires sent on request

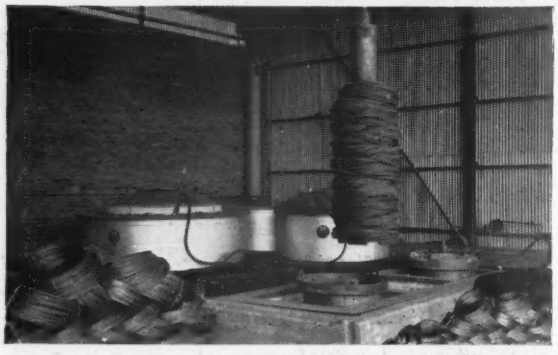
WINSTED DIVISION OF HUDSON WIRE COMPANY

WINSTED, CONN.

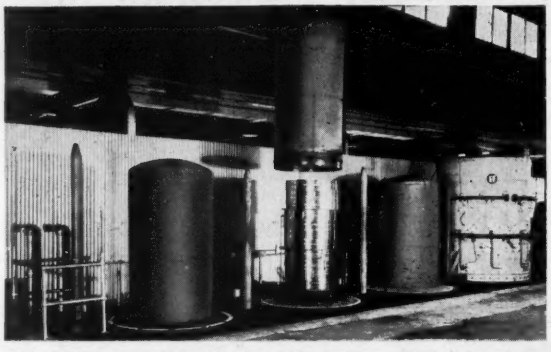
EF FURNACES

For Every Industrial Heat Treating Process

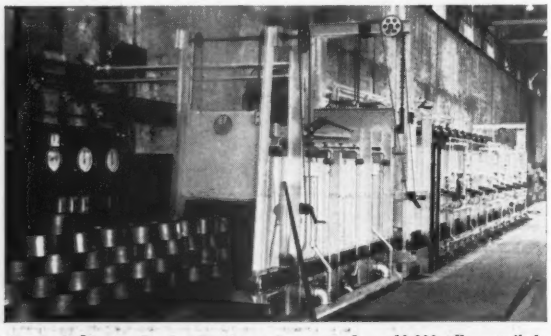
Gas Fired, Oil Fired or Electric Furnaces — For Any Product or Production



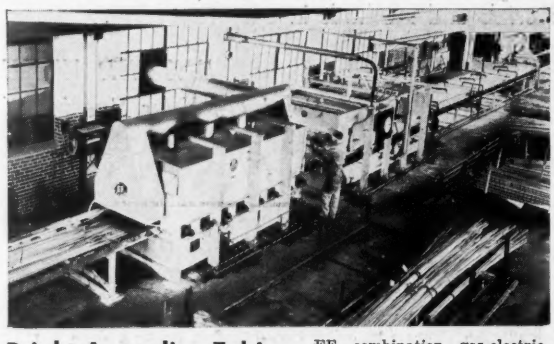
Normalizing and Annealing Rod EF circular pits are efficient furnaces with excellent temperature distribution. Also used for bright annealing wire.



Bright Annealing Strip, Wire, Etc. EF bell type furnaces maintain uniform temperature distribution throughout the material regardless of the size, weight or height of the charge.



Annealing Strip — Continuously 10,000 lbs. coiled copper alloy sheet per hr. annealed in this EF gas fired continuous roller hearth type furnace.



Bright Annealing Tubing EF combination gas-electric furnace; bright anneals 2,000 lbs. high carbon alloy seamless steel tubing per hour, without decarb.

Scale-Free Hardening Bolts, springs, gears, bearing parts, etc. are hardened uniformly and continuously in EF chain belt furnaces similar to the above.

Bright Annealing Copper Wire Another EF combination gas - electric furnace bright annealing copper wire. Handles rod in coils as well as fine wire on spools or reels.

Additional data on these and other types of EF Production Furnaces sent on request.

The Electric Furnace Co., Salem, Ohio

Gas Fired, Oil Fired and Electric Furnaces---For Any Process, Product or Production

furn-
uni-
ss of

ctric
,000
arb.

bin-
ctric
well